THE IRON AGE

THURSDAY, DECEMBER 19, 1889.

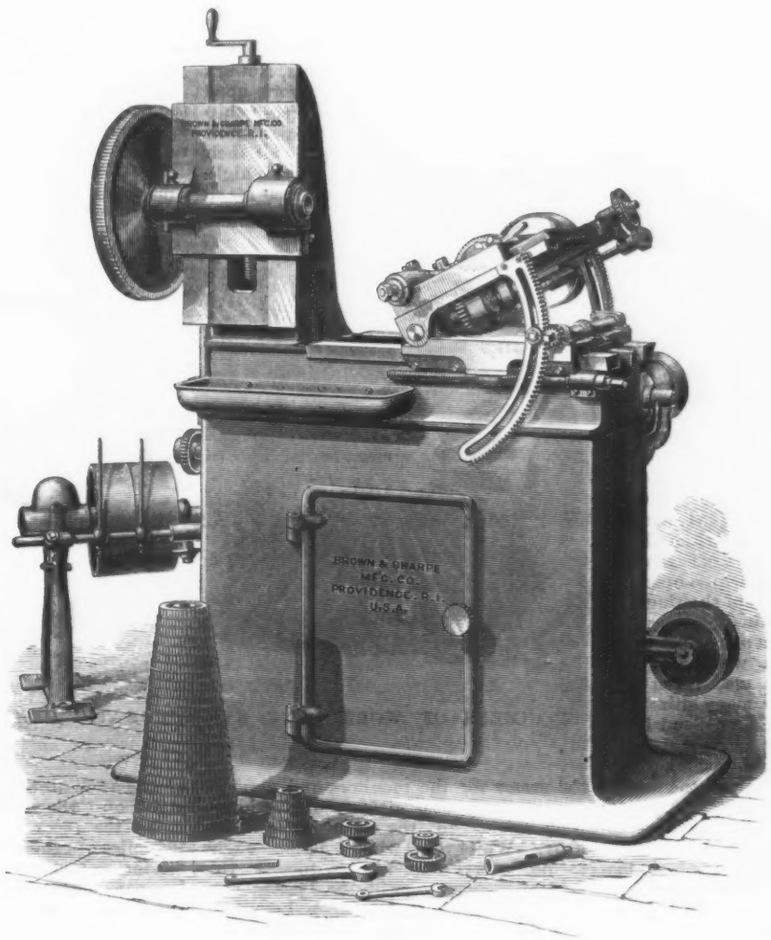
Ship-Building on the Lakes.

There are ten cities on the northern lakes, scattered along the frontier from Buffalo to Duluth, which are becoming important centers of the ship-building interest, and despite the propinquity of vast areas of forest affording the choicest materials for wooden construction, the use of iron and steel is calling into existence many important plants exclusively devoted to building in metal. The outlook for the year 1890 is promising. Inquiry regarding work in all of the ship-yards shows a total of 33 boats under construction, with a carrying capacity of 78,950 gross tons and a valuation of $5,800,000. At this time a year ago the ship-builders of the lakes had contracts for 59 boats, valued at $7,124,000, and capable of carrying 100,950 gross tons. Two years ago the capacity of 60 boats under contract was 108,525 gross tons, and their valuation $8,325,000. Of the 33 boats 20 will be of iron. Cleveland will turn out 13; Bay City, 6; Duluth, 4; Detroit, 4; Toledo. 1; Buffalo, 1; Gibraltar, 1; Marine City, 1; Milwaukee, 1, and Sheboygan, 1. Of the 33 boats all but 5 are steamers. The tendency to big steel steamers with no consorts is evident. According to latest reports the Canadian Pacific also aspire to enlarge the lake marine. It is said to be the intention of the company to build six fine steamers to ply between Chicago, Milwaukee, Gladstone and Owen Sound. Elevators and terminal facilities are to be provided at the latter point to save the long rail haul via Sault Ste. Marie around Georgian Bay. American builders will naturally look for profitable contracts. Considerable new tonnage will be required to replace losses; several first-class steamers, representing a value of $850,000, having passed out of existence. Altogether 14,000 tons have been stricken from the registers. Contrary to a common belief, heretofore it has been demonstrated that the most powerful boats are unable to cope with the frightful gales that occasionally sweep over the lakes.

A meeting of a number of plow-share manufacturers was held in Pittsburgh on Wednesday, the 11th inst., six firms being represented. J. S. Brown acted as chairman and W. W. Speer, of the Globe Plow Works, of Pittsburgh, as secretary. The advisability of advancing the price of steel plow-shares was considered. The recent advance in the price of steel has resulted in an advance in the price of the sheared product. This advance in materials is felt particularly by the plow manufacturers in the price of shares used in the making of cultivators. It was decided to increase the price of shares enough to overcome the increase in the cost of materials. The proposed advance and other business matters will be consummated by correspondence. All the members present reported trade to be in good condition.

Automatic Gear-Cutting Engine.

This machine, known as the No. 4 automatic gear-cutting engine, is arranged for cutting both bevel and spur gears, as shown by the engravings on the following page, of sizes not exceeding 18 inches in diameter, 4-inch face, and not coarser than 6 diametral pitch (about ½ inch circular pitch). It is entirely automatic in all its motions, cutting through for each tooth and revolving the wheel until all the teeth are cut, thus enabling the operator to attend to other work.



AUTOMATIC GEAR-CUTTING ENGINE, BUILT BY BROWN & SHARPE MFG. COMPANY.

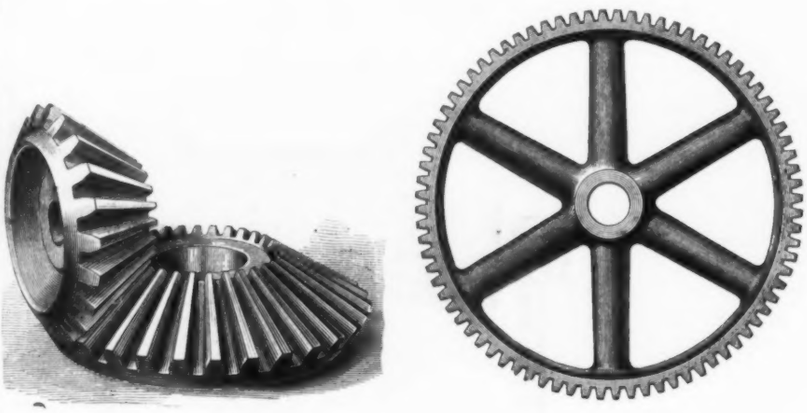
The indexing is done by a worm and worm-wheel moved by change gears. The blank being put in place and the cutter-head adjusted for length of stroke, the wheel is lowered by a screw having a dial reading to thousandths of inches until the proper depth of cut is obtained, when the cutter passes through the blank and back by a quick return movement; the wheel is then moved the proper distance for the next tooth, and so on until finished. The cutter-head is adjustable at any angle for cutting bevel wheels, the degrees being marked on a graduated arc, no other change being required. There is also provision for moving the cutter out of center each way for cutting bevel wheels. A suf-

ficient number of change gears accompany the machine for dividing all numbers from 12 to 50 and all even numbers to 100, also all numbers divisable by 3 to 150 and by 4 to 200. A closet in the base of the machine affords a convenient place for cutters, change gears, arbors and wrenches. Overhead works are furnished with each machine by the manufacturers, the Brown & Sharpe Mfg. Company, of Providence, R. I., consisting of self-oiling hangers, pulleys, shipper stud, stops, &c. Tight and loose pulleys are 10 inches diameter, 3¼ inches face. Counter-shaft should run 200 revolutions per minute. Weight of machine complete, prepared for shipment, about 2200 pounds. Floor space, 47 x 32 inches.

Bethlehem at the Maritime Exhibition.

In reviewing the exhibits at the International Maritime Exhibition the Boston *Herald* prints the following :

One of the most notable and remarkable displays of the exhibition has been put in place by the Bethlehem Iron Company, of South Bethlehem, Pa. Of the many valuable exhibits with which the exhibition abounds probably none other shows to so great an extent the marvelous strides this country has made in maritime science and mechanics. This exhibit consists of three immense splendid steel forgings made under the huge hydraulic presses now successfully at work at the Bethlehem company's shops. The first is a crank-shaft manufactured for the New South Hecla hoisting-gear of the Calumet and Hecla Mining Company. It is a hollow shaft of open-hearth fluid compressed steel ; length of body, 29 feet 1½ inches ; extreme length over cranks, 30 feet 7½ inches ; diameter, 16 inches ; throw of cranks, 4 feet ; weight, 17,434 pounds. The shaft was loaned to the Maritime Exhibition by the Calumet and Hecla company at the request of the Bethlehem company. It is the most beautiful piece of shafting ever manufactured in the United States and is fully equal to any product of a similar character ever made in the world. It is as highly polished as the mechanism of a watch, and will give to many citizens of Boston interested in the Calumet and Hecla Mining Company an opportunity to inspect the character of the machinery required to unearth the ore from the depths of their Lake Superior mines. A photograph placed upon the shaft gives a detailed description of it. While this shaft illustrates the perfection to which machine-finishing can be carried upon large masses of steel, the other two forgings are examples of the condition of Bethlehem's work when it comes from the hydraulic forge and before machining. One is a tube or barrel, for a 10-inch breech-loading high-power rifle. It is 27 feet 2 inches long ; largest outside diameter, 20½ inches ; weight, 23,000 pounds. At one end a ½-inch cut bas been taken for a distance of 3 feet, and one end has been faced to show the absolute soundness of the metal and the beauty of the forging. It has a 9-inch forged hole throughout its entire length, as regular and true as if it had been bored. The third forging is for a strengthening hoop of the 12-inch breech-loading rifle for the United States Army. It is a cylindrical hollow forging, 6 feet 3½ inches long; outside diameter, 47½ inches; inside diameter, 38⅝ inches; weight, 12,940 pounds. These forgings are perfect in many senses, and have already excited the greatest enthusiasm and admiration. The modern high-power steel breech-loading rifles, for which these forgings are intended, are composed of a tube, or barrel, a long jacket extending over the rear half of the tube, and several layers of strengthening hoops. The exhibit further demonstrates the ability of the people of these United States to reach excellence by a shorter path than our neighbors across the sea when we once enter upon a policy. The shops where these magnificent forgings were made were commenced less than three years ago. They now cover several acres, and are filled with special tools capable of manufacturing and finishing the most powerful guns and the heaviest shafting and armor-plate. The shafting of the Baltimore and Yorktown came from the shops of the famous firm of Sir John Whitworth & Co., and was made of fluid compressed hydraulic-forged open-hearth steel, these orders having been placed before the Bethlehem plant was erected. What is so well known in the foreign world as Whitworth fluid-compressed steel has already been replaced in this country by Bethlehem fluid-compressed steel, and Bethlehem steel is now the standard for heavy shafting, gun forgings and armor-plate. The company have supplied all the shaftings for the cruisers Philadelphia, Newark and San Francisco, and are at work upon that for the armored coast-defense ship Maine. The War and Navy departments have placed with this company all their orders for 8-inch, 10-inch and 12-inch high-power rifled guns, and the contracts for all the armor for the monitors and armored cruisers and coast-defense vessels have been given to the Bethlehem company. While the whole nation ought to be, every one who witnesses this exhibition surely will be justly very proud of Bethlehem's work in releasing the United States from dependence upon foreign manufacturers for the supply of heavy guns and armor for our defenses and shaftings for our ships. The exhibit has been set up by Lieutenant Jacques, late of the navy and member and secretary of the gun foundry and other boards, who resigned his commission in the navy to become the director of the ordnance of the Bethlehem Company. This magnificent collection is supplemented with drawings and photographs of the works. One large photograph by Gutekunst, of Philadelphia, is 7 feet long and 4 feet wide, and shows in detail all the immense buildings of the unique establishment. One has but to look at this wonderful display to appreciate fully the importance of such an establishment, in its ability to supply the needs of our war and mercantile marine. Its vast importance can perhaps be better appreciated when we recall that in the absence of a suitable plant in this country for the manufacture of heavy steel shafting, three of the ships of the squadron of evolution had to be equipped with iron shafting of greater dimensions and weight than if they had been made of a higher quality of steel, making serious demands upon the spaces and weights so greatly needed for fuel and ammunition and store supplies.



SPECIMENS OF WORK DONE BY AUTOMATIC GEAR-CUTTING ENGINE.

The New Providence Cable Tramway.

The trial trip over the new cable tramway, Providence, was successfully made Wednesday afternoon, December 11, one of the small open cars being used, and the entire distance of three miles was made, without a stop or accident, over the hitherto insurmountable obstacles of the East-Side Hill.

For the past quarter of a century schemes of more or less practicable nature have been proposed for overcoming this barrier. The builders of this road were the Lane National Construction Company. At the head of this company is H. M. Lane, one of the most successful cable-road builders in the country. Mr. Lane, although still a young man, is a constructing-engineer of 15 years' experience, and is the patentee of much of the machinery and appliances which are to be used in the running of the new road. He built the Vine street and Walnut Hill cable lines in Cincinnati, each 8 miles in length, both of them climbing hills three times the hight of College Hill in that city, and broke the record in Denver by building 12⅞ miles of cable road and a magnificent driving-station for the Denver Tramway Company, between July 16 and December 18 of last year. Mr. Lane's principal assistants were Charles H. Fitch and E. R. Baker, draftsmen; Charles A. Mixer, civil-engineer; W. S. Downey and Richard Tierney, superintendents.

Mr. Mixer is the inventor of many of the devices in use upon the road, including the elevation of the curves. Because of the lateral force necessary to deflect a car from the straight line, the track rails for a curve are made with high guards for the inside. It has been found upon all horse and cable tramways that a jar always occurs upon entering and leaving a curve. As the result of extended observation and study this system alone builds its curves so that the cars can be run around them without this disagreeable lurching. Persons standing in the cars ride around curves without the risk of being thrown off their feet. This is accomplished by carefully adjusting the elevation and gauge of the tracks and by peculiarly shaping the ends of the guard-rails, so that the car-wheels are guided immediately on entering a curve, instead of being compelled to run unguarded across the wide groove and strike violently on the other side, as is usually the case in other tracks.

Mr. Mixer came to the city in November, 1888, and in order to save their charter under his direction the company laid a short section of track 400 feet in length on Angell street above Cooke that fall. The light T-rail of 35 pounds to the yard adopted in its construction was not used in any other portion of the line. It was found impossible to pave up to it, and so an entirely different track rail was laid for the remainder of the road. It is called the Lane yoke-rail, was patented last spring, and is used in Providence for the first time in the world. It is a girder rail. A flange is put down deep. A bead on the opposite side prevents it from springing upward—a tendency of all rails after they are laid. The flange and head present quite a formidable opposing section of metal to that at the head, which secures stability, firmness and symmetry. Furthermore, additional strength is secured to the yoke by inclining the web. The car-wheels roll upon its head, which is not excessively wide, like some other rails, and hence obviates the liability of the slipping of horses' shoes. It weighs 40 pounds to the yard, and is rolled in 32-foot lengths the same as the slot slides. This girder rail rests upon and is notched in the outer end of the bracket-like yokes, making a simple yet extremely strong fastening.

The slot rail is made in 32-foot lengths, weighing 50 pounds to the yard. Both center and side rails are manufactured from the same steel as is specified for the Pennsylvania Central Railroad. The concentration of metal is at the top of the rail, in order to provide greater lateral stiffness where most required, and there is an almost total absence of the usual broad lower flange at the bottom, where stiffness is not essential. The web is not uniform in thickness, but below the bolt, at which point the necessity for the thickness of metal ceases, it is much reduced to the very narrow flange at the bottom that is set into the notch in the yoke. The upper surface of the slot rail is $\frac{3}{4}$ inch above the head, to insure drainage from instead of into the slot.

Richard Tierney has had charge of special work, terminals, curves, &c., while W. S. Downey, who has had charge of the construction of more miles of cable road than any other man in the country, has superintended the construction of the straight track. The caterinary curve modifications, deep yokes and tunnel under Benefit street, to preserve the plane in which the cable runs, are among the most important changes decided upon since last spring's work began.

The two machines which will run the cable are Harris-Corliss latest automatic cut-off engines, the largest of 165 horse-power and the smaller of 150 horse-power.

In order to start the car the foot is removed from a treadle, which releases the wheel-brakes. A hand-lever is pushed forward, which releases the track-brakes. The wheel on the grip is then turned in the direction of the sun, closing the jaws on the cable and the car moves along with it.

The brakes on the grip-car are three. First, the wheel-brakes, four in number, one on each wheel. Each is a chilled-iron shoe, which conforms to the face of the wheel. By the treadle they are pushed against the wheel with sufficient force to stop their turning. The track-brakes are two, one on each side between the wheels. These have each a wooden shoe, $1\frac{1}{2}$ feet long, which fits the head of the rail. They move vertically and by the lever-handles are pressed down on to the track with force enough almost to lift the car from the track. The are are four sand-boxes on the car containing dry, sharp sand. By pressing a button with the foot this is sprinkled between the rails, brakes and wheels, increasing the friction. But for an emergency there is still another device, the chock-brakes. These are four blocks, bound with rubber, that may be instantly dropped, one for each wheel, by kicking a latch. The car is then tightly held to the track by the adhesive qualities of the rubber, and cannot move in any direction. It must even be pried loose with crow-bars before it can be started from the track.

The engine-power required in the economic running of a cable-road has a piston speed too fast for the rope, and must necessarily be reduced by wheels of different sizes. On the main shaft is a wheel 6 feet in diameter which by means of cotton ropes drives one 25 feet in diameter, on the shaft of which is the cable-drum only 10 feet in diameter. By this means the economic engine speed is reduced to the practicable cable speed.

For the tension-carriage, the object of which is to keep the cable taut, a new design is used for the first time. Heretofore all cable roads had a deep pit the length of the house, which was altogether objectionable. This floor is the first to be laid flush. The carriage is a rectangular frame with a wheel at each corner. On each side are frame standards, on top of which is a 10-foot sheave. The cable after leaving the driving-drum passes around this sheave. From the back of the carriage is a rope leading to a set of weights in the back of the building hung over suitable wheels. The weight may be increased or diminished to furnish a constant tension on the cable to any amount desired. It takes out all the slack in the cable and prevents jerking of the cars when applying the grip. Also on each side of the wheel below the frame are hung weights with an elbow-joint and a pawl which gauges in a rack on the floor. This is an additional and a variable tension according as the elbow-joint is pulled straight or much bent.

The power-house, which is built of brick with rough stone trimmings and a glass front, stands on South Angell street on a site that nature seems to have prepared for it, as the lot is lower than the grade of the street, thus rendering it possible to utilize the second story for car-house, waiting-room and offices, while the basement is used for boiler-room, machinery and repair-shop. On the street-floor the waiting-room is provided with a gallery from which the driving-machinery in the basement can be viewed. The structure has a frontage of 115 feet and a depth of 134 feet. It has a smoke-stack 120 feet high.

The large drum revolves at exactly right angles to the direction in which the cable moves on South Angell street, the corners being turned simply as in any machinery where pulleys are used by means of four 10-foot sheaves in the wheel-pit, which is under the track in front of the station. Two of the grooved wheels revolve on the same axis, while from and on to each the cable is taken and released at right angles by sheaves turning underneath and in the same plane with the grip-slot.

The cable moves over and around the hundreds of sheaves with little noise compared with the rumbling and grinding sounds and the noise made by some roads. The $1\frac{1}{4}$-inch cable used is said to be used in but one other city in America, Los Angeles, Cal., which is the Western or Pacific limit of this kind of tramway construction, as Providence is the Eastern or Atlantic limit. In most other cities the cable is $1\frac{1}{2}$ inches in diameter, while in Kansas City it is $1\frac{1}{4}$ inches. A $1\frac{1}{2}$-inch cable used on the Gilbert avenue line in Cleveland, of the same length as this, cost about $4300. The three miles of wire rope for the Providence cable tramway cost about $3500. The life of a wire cable is about a year. Sometimes it wears evenly and sometimes very unevenly, owing to unaccountable differences in quality of material. When the main wire of a strand breaks the cable at that point is materially impaired. Every night after traffic is over the cable is run slowly through the power-room, where the splicer carefully inspects it for flaws, which are promptly attended to.

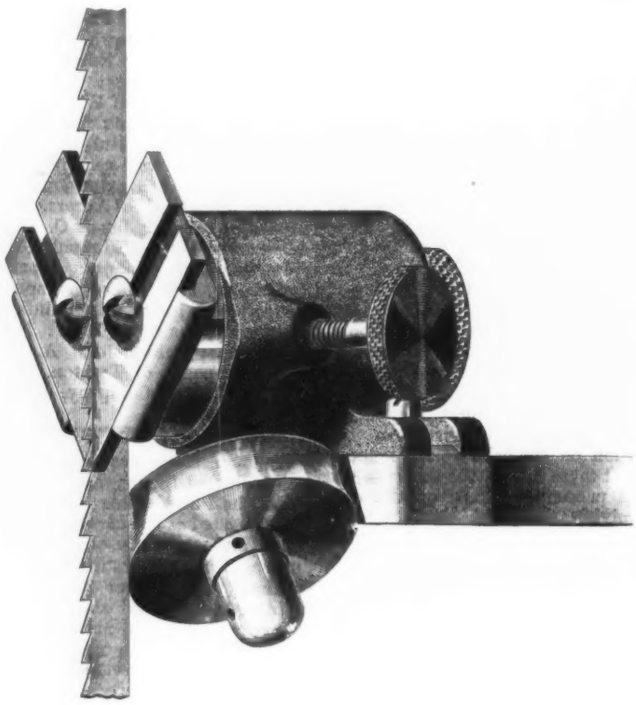
The cost of the construction of this tramway, including building and equipment is about $250,000. The contractors for stock, machinery, labor, &c., were: William A. Harris Steam Engine Company, of Providence, engines; Whittier Machine Company, of Boston, boilers and piping; Robert Poole & Co., of Baltimore, driving and winding machinery; Johnson Company, of Johnstown, Pa., steel rails of all kinds and yokes; Edmund Grinnell, of New Bedford, yokes; Carolina Oil and Creosote Company, of Wilmington, N. C., creosoted wood siding for tunnel; Pennsylvania Bolt and Nut Company, of Lebanon, Pa., bolts; carrying and curve sheaves, with box extension curbs, from Nathan Steadman, of Aurora, Ind.; drain-pipe and cement, James C. Goff, Providence; grip-traps, Edmund Grinnell, of New Bedford; Johnson Company, of Johnstown, Pa., splice-bars, special angle slot-rail and guard-rail; buildings, excavating and masonry, E. W. Dornsife, of Providence; cable, John A. Roebling's Sons Company, of Trenton, N. J.; cars, John Stephenson Company, of New York.

Announcement was made in Pittsburgh last week that the magnificent office building of the Philadelphia Natural Gas Company, located at the corner of Penn avenue and Ninth street, in that city, had been purchased by the Westinghouse Air Brake Company for the sum of $600,000. The building was erected about two years ago and is probably the finest office building in Pittsburgh. It is nine stories in hight and contains three electric elevators, which are running continually all day. The floors are all tiled and the lower part of the walls are marble. Two entrances to the building are composed entirely of marble. In the large offices glass partitions set in highly polished brass posts give privacy to the occupants. The fixtures of the offices are also very costly. When the new works of the Westinghouse Air Brake Company, now in process of erection at Wilmerding, are completed, the company will move their offices from Robinson street, Allegheny, to the building just purchased. In addition to the Philadelphia company the following corporations occupy offices in the building: The Westinghouse Electric Company, the Allegheny County Light Company, the Keystone Construction Company, the Fuel, Gas and Electric Engineering Company, the Union Switch and Signal Company, the Standard Underground Cable Company and the Standard Car Heating and Ventilating Company. The Penn Club will occupy the ninth floor of the building when they are organized.

The Lehigh Zinc Company, who have been using the Taylor producer on a spelter furnace for the past six months, are now preparing to enlarge the plant and use them on other furnaces. The Bethlehem Iron Company have eight in use and two more building. One is being erected at Steelton for the Pennsylvania Steel Company, and a plant of six large producers is nearly ready for shipment to Bolivia for the Huanchaca Company, which is the great gold and silver mining company of South America. All the char kilns of the Brooklyn Sugar Refinery will be equipped with these producers by the beginning of the year. The company are also erecting producers in the neighborhood of Pittsburgh and in Alabama, California and other places.

Band-Saw Guide.

In the accompanying illustration we present a general view of a new band-saw guide invented by R. McChesney, and which is being placed upon the market by Goodell & Waters, 3101 Chestnut street, Philadelphia, Pa. The construction of this device is such that friction is greatly reduced, and the adjustment for saws of different widths a very simple operation. In its downward



BAND-SAW GUIDE.

motion the saw revolves the wheel forming the back guide, and which is set on an angle, preventing cramping or twisting of the blade. The manufacturers state that the wheel, running on a ball bearing, requires no oil, does not heat and is always in proper adjustment. With each guide is provided wood and metal side-pieces, which are readily set for different-gauged saws. The statement is made that the revolving wheel referred to keeps the saw firmly up to its work and has a tendency to straighten the blade at the back. The thumb-screw clearly shown in the illustration adjusts the jaws for saws of different widths. The device is made as upper and lower guides, and is applicable to any make of machine and also to large band-resaws.

Now that the great culm banks at the coal mines in Pennsylvania are being successfully manufactured into brick-fuel for general use, a struggle has commenced for their possession. At the Draper Colliery, near Reading, the firm of Beddall Brothers & Co. claim the right, under a lease, to run a siding to an extensive bank of coal-dust near at hand, but the colliery proprietors, backed by the Philadelphia and Reading Railroad Company, claim that the Beddalls have no right to do this. Recently the workmen employed on either side engaged in a sharp conflict.

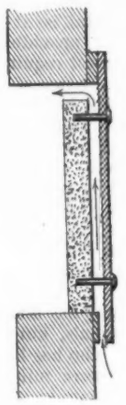
The Cornell Iron Works have been engaged for some time past in building a continuation of the elevated trestle from 159th to 162d street, to enable the engines to take coal at the end of the route. This stretch of trestle is being built along the river edge. Two large elevators will be used to hoist coal directly from canal-boats into pockets, from which the engines will draw their supply.

Steel Ship-Building on the Pacific Coast.—Steel ship-building is now an established industry on the Pacific Coast, deriving its origin from the awarding by the General Government of contracts for the new steam cruisers. Work on the new coast-defense vessel Monterey is progressing rapidly. The vessel is now about half completed. She will be launched by July, 1890. Over 1400 men are actively at work in the yards of the Union Iron Works, of San Francisco. Not the slightest delay is being experienced in the receipt of material, the Pacific Rolling Mills keeping up the supply without trouble. The machinery construction is keeping pace with the hull work. The Union Iron Works people are particularly anxious to make a good showing on the Monterey. The cruiser San Francisco has been launched for over a month. Her machinery is finished and is at present being placed in the ship. Officers of the company believe that the vessel will be ready for her preliminary steam trials some time in the latter part of February. The cruiser Charleston has now passed out of the hands of the contractors and is at the Mare Island Navy Yard receiving her outfit. The San Francisco, like the Monterey, is to be fitted out entirely at the Union Iron Works, and for the first time in the history of the naval service a vessel is to come out complete from the yards of the contractors.

A prison labor bill adopted by the New York Trades Assembly will be pressed upon the State Legislature with the object of prohibiting the sale of any articles manufactured in whole or in part by inmates of penal institutions and reformatories supported by the State, but requiring that such articles shall be wholly utilized by charitable institutions.

Westinghouse Machine Company's Works.

It is always of interest to visit a workshop where a well-known machine is produced, for the simple reason that we always expect to find methods and appliances fully equal in all respects to the quality of the machine produced. In other words, if the machine built is of a decidedly superior character we naturally conclude that the machinery by means of which it is accomplished and also the methods pursued bear superior merit in the same ratio. We recently had the privilege of passing through the works of the Westinghouse Machine Company, in Pittsburgh, where the well-known Westinghouse engines are turned out. A brief outline of how this business was brought to its present magnitude may be of interest. It has always been the policy of the company to build engines of certain standard sizes, from which no variation whatever has ever been permitted. It has further been the custom to keep ten or more of each of the sizes in stock, this of course being done to facilitate the quick filling of orders. Five years ago ten standards, ranging from 4 horse-power to 125 horse-power, were built. The warehouse was filled with these engines, and the works



Cupola-Door.

run on those sizes which were not well represented in the store-house. The smaller sizes have always been made on shop orders of 100. All parts are interchangeable, are made in quantity and assembled as needed. The company have perfected a system of organized agencies in all parts of the country in order to secure first-class engineering ability, on the ground that it is dangerous to trust the first installment of their engines to those who may be fully ignorant or who may be prejudiced.

JUNIOR AUTOMATIC.

In the South and Southwest the company went into direct competition with engine-builders, having ascertained that the user in general, while liking the engine and its qualities, wanted something cheaper. They ascertained at what price the commonest slide-valve engine was generally sold and the sizes used. They found that 90 per cent. of the trade in that part of the country could be covered by three sizes of engines, and powers of 15, 25 and 35 horse-power were manufactured. This started the business in the Junior automatic, which was well received, and while its interior construction and finish were the same as in the larger and more costly sizes, its exterior was devoid of unnecessary finish, this bringing the cost of the engine down to a

price at which it could compete successfully with the common slide-valve. It was reduced in weight whenever possible without reducing the strength and labor was saved on its construction at all points. The first Junior engine had a Corliss rocking-valve, which was afterward replaced by the regular balanced piston-valve. This engine was quickly successful, and as the trade increased it was found advisable to add three other standard sizes, and 5, 10 and 50 horse-power were designed. To these will now be added a 75 horse-power whenever the condition of work in the shops makes this possible. These engines are made in quantities of never less than 50, and usually 100.

AUTOMATIC COMPOUND.

The company were then called upon to design an engine superior in regard to fuel economy to the Junior or Standard. This led to the designing of a theoretically perfect indicator card, and then making an engine which would approach this card as closely as could be done in practice. Experiments carried over a period of one and one-half years brought the automatic compound to this point. Of this engine nine sizes are now built, using steam-pressure up to 150 pounds, the dimensions ranging from 8 x 13 cylinders and 8-inch stroke to 18 x 30 cylinders and 16-inch stroke, or from 35 horse-power to 250 horse-power at 100 pounds pressure. In addition to the automatic compound and the Junior, the company now build the following sizes, known as

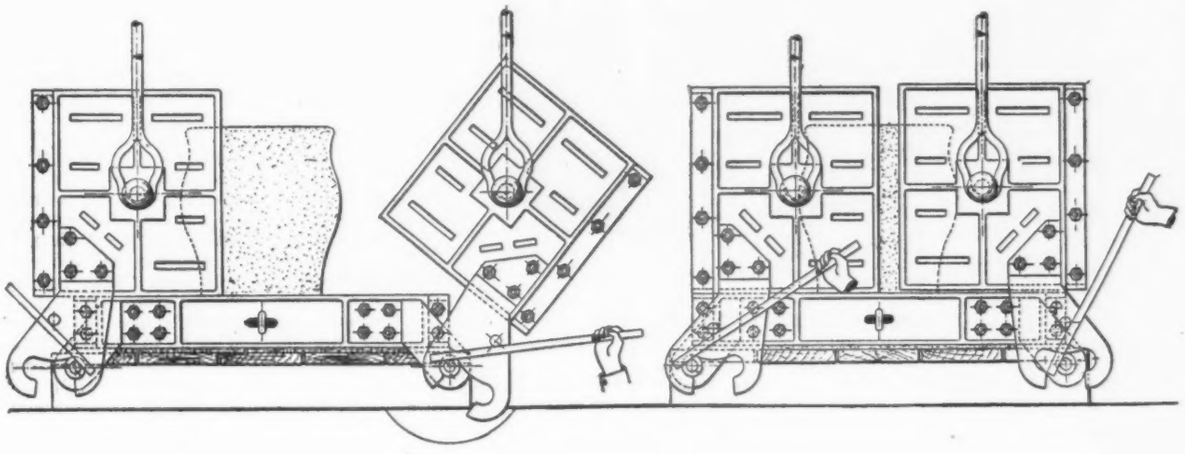
STANDARD AUTOMATIC.

Horse-power.	Cylinders. Diameter.	Cylinders. Stroke.	Revolutions per minute.
5	4½ inches.	4 inches.	500
10	5½ "	5 "	500
15	6½ "	6 "	400
25	7½ "	7 "	390
35	8½ "	8 "	375
45	9½ "	9 "	350
60	11 "	10 "	320
75	12 "	11 "	300
100	13½ "	12 "	300
125	14½ "	13 "	290
150	15½ "	14 "	280
200	18 "	16 "	250
250	20 "	16 "	250

FOUNDRY.

The foundry, forging-shop and heavy machinery department are in a building 480 feet long by 100 feet wide, of which the foundry occupies about one-half. All pig-iron is delivered on the ground-floor and taken to the cupola-door by an elevator. Coke is received directly on the platform. Sand is delivered in bins at the end of the foundry adjoining the cupola in order to save handling as far as possible and to facilitate the quick delivery of material where it is needed. Above the cupola platform is a hood having a conical shape and of about the same size as the platform, in the apex of which is a flue leading up through the roof. A blast sent through this removes the hot air from the platform and makes it much more convenient and pleasant for the workmen. The cupola-door, of which we present a rough vertical section, was designed by the foundry superintendent, H. H. Garrett. Although it has been in the place on the cupola over two years, the outer sheet of iron, which we judged to be about ¼ inch thick, was not warped in the least, and is always so cool that it barely feels warm to the touch. The construction of the door is extremely simple and will be understood from the drawing. To the rear side of the door and held a little way from it is a fire-brick plate some 2½ to 3 inches thick which when the door is closed rests upon the bottom of the cupola opening, while at the top and between the iron plate and the fire-brick is a space of about ½ inch. When the blast is on the current passing up the cupola draws in a current of fresh air which passes up between the iron plate and the fire-brick backing and enters the stack. This current has been found to be sufficient in its cooling effects to keep the iron plate of the door in as perfect condition as it was when first put in place.

We noticed a frame for drying ladles, which consisted of a rectangular shape of bars of iron placed parallel with each



Figs. 1 and 2.—End Views in Elevation, Showing Different Positions of Movable Cheeks.

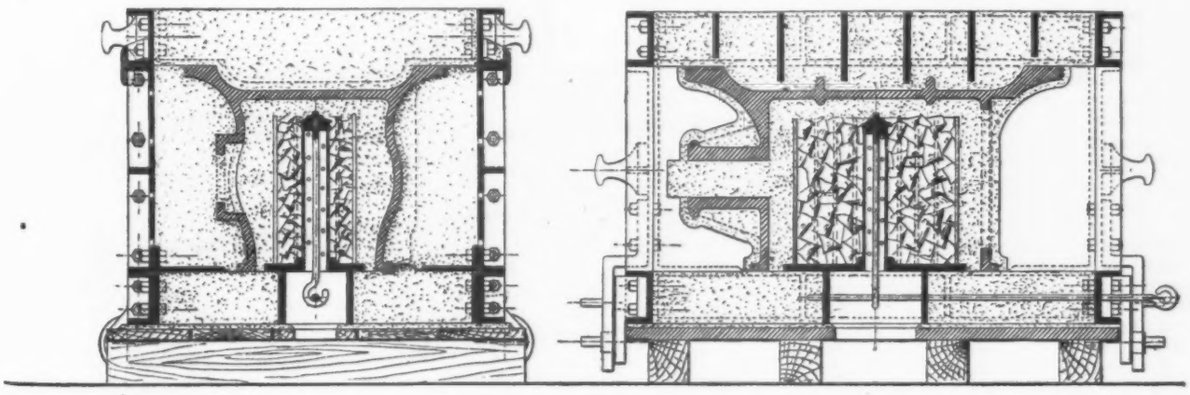
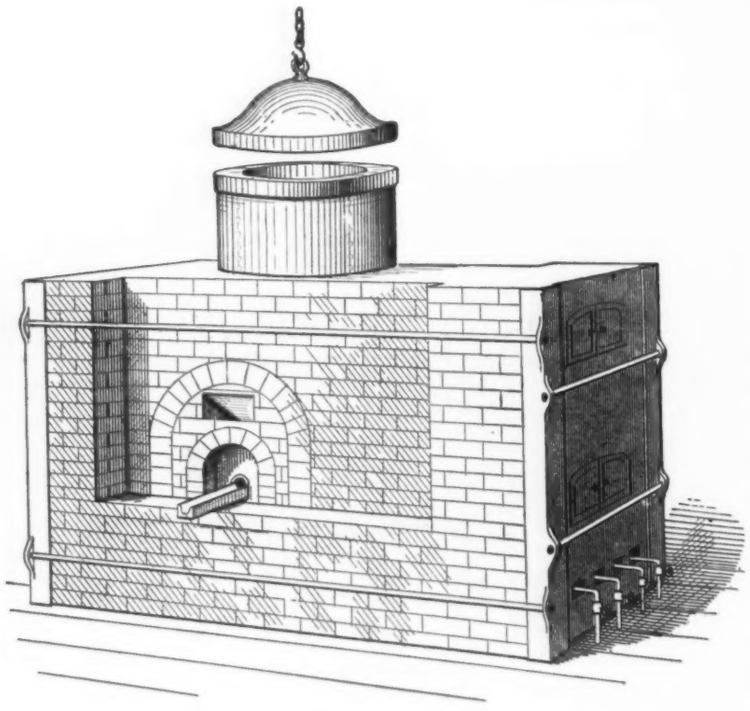


Fig. 4.—Vertical Transverse Central Section, Showing Mold and Core in Position.

Fig. 3.—Vertical Longitudinal Central Section.

FLASK FOR MOLDING THE CRANK-CASES.

other and so spaced as to support the ladle and handle carrying it. After a pot has been lined, it is placed in the handle and on this frame dried by means of a jet of natural gas introduced in the inside. All big cylinder work is cast in green sand,



BRASS-MELTING FURNACE.

cores and all, and a 5000-pound casting is an every-day occurrence.

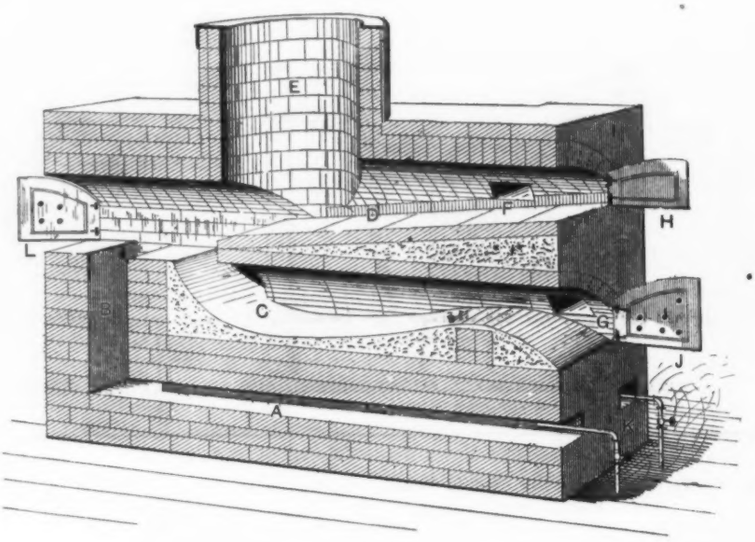
MOLDING CRANK-CASES.

An ingenious arrangement for molding the crank-cases which, as is well known, inclose the cranks of the engine and form a reservoir, in the bottom of which oil, acting as a lubricant, is placed, was invented by Mr. Garrett. Of this we show several drawings. The object in designing this flask was to provide a way in which castings having lateral flanges or re-entering curved faces, could be accurately made by the employment of green-sand cores, and was intended for use particularly in the casting of the crank-cases above referred to. The cope is rectangular in form, and is provided with the usual cope-bars for separating the sand and rests upon the top of the cheeks, each of which is a two-sided box or case open upon its four sides, except in so far as the latter is closed by division plates projecting inwardly from its ends, these plates being shaped on their inner ends to correspond with the casting to be formed. The division-plates of the opposite cheeks abut one against the other when the parts are in position for the pouring of the metal. Each of the cheeks is hinged at bottom to a nowel by lugs or hinge-plates secured to its opposite ends, each of the plates having an elongated slot or recess at its lower end, fitting over a hinge-pin, fixed to the end of the nowel. The recesses are semi-circular at their ends, at which they are of corresponding diameter with the hinge-pins, and their intermediate portions are slightly convex or curved downwardly from a horizontal plane, so that by the application of levers to the outer portions of the hinge-pins as fulcrums, the levers bearing against pins on the hinge-plates, the cheeks may be moved transversely upon the nowel, being by the curvature of the recesses slightly raised from the top of the nowel during their traverse to or from the positions which they occupy when the mold is ready for the pouring of the casting, as shown on the left of Fig. 2, and from or to positions in which they can be swung downwardly to expose their open inner sides, as shown on the right of Fig. 1, the inner ends of the recesses then fitting over the hinge-pins. The cheeks are suspended from a crane by links coupled to pins on the ends of the cheeks, and when in their outer positions are swung upon the pins by lowering the links. It will be seen that by moving out and turning down the cheeks, the operation of which is shown in Figs. 1 and 2, unobstructed access is afforded to the central portion of the nowel and to the cheeks for the formation of the core and the side portions of the mold respectively, and the cheeks being entirely clear of the core while swinging on their hinge-pins, there is no liability to injury of the core or mold in the movements of the cheeks.

The accessibility and facility of manipulation afforded renders the use of green-sand cores readily practicable in the flask. The central and major portion of the core, Figs. 3 and 4, is filled up with fragments of coke or analogous material, which are inserted between and maintained in position by a series of core-supporting rods, secured to and extending vertically above a horizontal plate or core-iron, which is supported upon a frame, open at its upper and lower sides and located centrally in the nowel on the bed upon which the same rests. A perforated vent-pipe for the escape of gases is fitted into a socket in the core-iron above an opening therein, and the core-iron with its supporting-rods and filling is held in position by a removable holding-down bar, passing through one end of the nowel and fitting-holes in the supporting-frame of the core-iron. A rod is screwed at its upper end into the cap of the vent-pipe and engages the holding-down bar by a hook on its lower end. The holding-down bar thus serves to maintain the core in position, and upon its removal, after the completion and cooling of the casting, the casting and the core may be removed together from the flask.

FOUNDRY APPLIANCES.

In the foundry are three power and three hand cranes for handling the work. In the end near the forge-shop are core ovens provided with two carriages on tracks and heated with natural gas. One of them is divided into two compartments and contains reels for light work. The cleaning of castings is facilitated by a jet of air under pressure, flexible hose permitting the application of the air to all parts of the castings easily. This method has been found to work admirably, and to fully and quickly remove all sand and dirt adhering loosely to the casting. The air-pressure used is 70 pounds. In this end of the foundry is also a compressed-air trolley, operating upon overhead tracks so arranged that the heavy castings can be picked up and carried to points where the next operation takes place.



BRASS-MELTING FURNACE.—PART IN SECTION.

FURNACE FOR MELTING BRASS.

A peculiarity in the foundry, and one which we think is employed only in this case, is the furnace for melting brass, and

which was also designed by Mr. Garrett. This, as will be seen from the perspective and sectional perspective we herewith present, consists of a rectangular brick oven, in which are flues arranged as shown in the section. Natural gas is used as the fuel and is led into the furnace through four pipes, K, placed near the bottom at one end, the gas passing the flue A up the flue B and then turns to the right as we look at the drawing. It is now free to take one or both of two courses, either up through the flue F, which leads to the chimney, or through the flue G, passing on its way along the passage C and thence up to the chimney. The upper flue F is one-half the size of the lower one, G, it measuring 3 x 10 inches and the other 6 x 10 inches, the object being to draw the larger part of the gas through the bosh C. The charging-hole, which is closed by means of a cover, is shown at E and charging-door H, opening into the melting-chamber D. It is evident that as the brass is introduced into the furnace, that directly under the charging-hole and in the chamber D is subjected to the greatest heat, while that nearest the door is under the influence of a lower degree of heat. As the metal melts it flows from the chamber D to the bosh C, from which it is tapped through the opening shown in the perspective view. The main gas-flue is 6 x 9 inches, the vertical-flue 9 x 42 inches, and the mining-hole in the side 8 x 12 inches. The furnace has been found to work well and to give an output of molten metal far in excess of that derived from pots using the same quantity of gas.

Test No. *127.* *Copy.* Date, *June 28, 1889.*

OFFICE RECORD.

Number of engine, *88.*
Class of engine, *Automatic Compound.*
Size of engine, *10 and 18 x 10.*
Maker's name, *The Westinghouse Machine Co.*
Engine used for
Tested at *Shops at Pittsburgh.*

Tested for *Alva H. Kirk.*
Address *Fergus Falls, Minn.*
Jacketing, *None.*
Steam lap, *⅛ in.*
Exhaust lap, *0 in.*

TESTERS' RECORD.

	1	2	3	4	5	6
Number of engine	88					
Boiler pressure	100					
Speed	322					
Brake load	480					
Dead weight on scales	25					
Time of start	11	11 20	11 40			
	11 10	11 30	11 50			
Time of stop	11 20	11 40	12			
Duration of test	20	20	20			
Full barrel, "A"	366	365	365			
Empty barrel, "A"	100	100	100			
Full barrel, "B"	361	365	365			
Empty barrel, "B"	96	100	100			
Water used	531	530	530			
Water per hour	1591					
Vacuum						
Temperature of discharge						
Leakage *per hour*	None					
Brake radius	27	¾"				
Spring	40					
Initial pressure	98					
Terminal pressure	8					
Ratio of expansion	4 91					
High pressure M. E. P.	51 5					
Low pressure M. E. P.	17 7					
Indicated horse-power	69 39					
Brake horse-power	64 51					
Loss or friction	4 88					
Percentage of loss	7 03					
Gross indicated water rate	22 93					
Gross brake water rate	24 66					

REMARKS.

Indicated by *Nelson C. Wilson.*
Water weighed by *Thomas S. Grubbs.*

SIGNATURES OF TESTERS.

Nelson C. Wilson.
Thomas S. Grubbs.

FORGING.

In the forge-room are two steam-hammers, of 800 and 6000 pounds. In the room adjoining, which is a machine-shop intended for the heaviest work, are a 7-foot boring-mill, 10-foot boring-mill, 6-foot square planer having a bed 18 feet long and a lathe intended for unusually massive work. Overhead are traveling-cranes for handling the work. Adjoining this is the

MACHINE-SHOP,

which is 264 feet long by 100 feet wide. As far as possible the machines are so arranged that as the castings come from the foundry they are taken, in regard to their weight, by the first machines in order to save the expense of handling. They then pass down the shop, cranes being provided to do the transferring, and so on to the assembling-room. Through the middle of the shop is a track upon which the heavier castings are handled. Under this shop is a store-room for repair parts, and in the room above is a second shop where the lighter work is carried on. The machines used are those of the usual pattern, except some designed for special work. Compressed-air presses are employed for driving the bushings into the journals. In the lower end of the machine-shop is a cylinder-boring machine, built by Sellers, for boring at the same time the two cylinders of the larger sizes of engines, and adjoining this is a second boring-machine in which the two boring-bars are spaced the same distance as the cylinders are apart, and are driven by a worm and gear, the worm extending at right angles to the boring-bar and its shaft being provided at one end with a cone pulley. The casting is mounted on a bed somewhat similar to that of a planer, and the feed of which is provided at the opposite ends of the boring-bars. A new drill which will finish the four sides of the crank-boxes at one setting has just been put in place by the Universal Radial Drill Company. The arrangement for counterbalancing wheels is very simple, and at the same time very effective. Two perfectly level straight-edges are located at one end of the shop, and upon this the wheel, mounted upon a shaft, is placed. Within convenient distance of this frame is a drill by means of which the wheel can be drilled wherever necessary, and also a small ladle in which lead is melted by means of gas, so that holes can be filled with lead as counter-weights when necessary.

TESTING.

Opening from the lower end of the shop is the assembling-room, which is provided with cranes and tracks in order that the work of putting the engines together may be carried along as rapidly and economically as may be, as the engine after being assembled passes to the testing department, which is at the further end of the assembling-room. Here every engine built by the company is tested under steam-pressure, and is also tested under power by means of brake. They are put under steam for at least ten hours and a complete record of all compounds is kept on a printed form of their performances during the time. They are then taken apart and each piece inspected to see what the test did and if it developed any weakness. If found defective the part is replaced and a second test, similar in every respect to the first one, is again gone through with. If the engine comes up to the standard established it is sent to the warehouse, while the record is sent to the office and there put on file. The testing-room on three sides is provided with beds adapted to receive any of the sizes of the engines built and the steam-pipes are arranged overhead, while the brakes for applying the power when the engine is tested in that way are conveniently arranged. In this department, as in all others in the works, the aim is to expedite the work and to provide every convenience known in order that the time consumed in a certain operation may be reduced and also that the labor necessary for accomplishing a certain work may by means of these appliances be lessened. In testing the compound engines there are also the necessary surface-condenser scales, &c., for weighing the water.

As will be seen from the accompanying table, which is a copy of the record made by an engine, every essential point in the performance of the steam-engine is provided for, and if at any time an engine develops while out of the works an unexpected weakness, these records can be brought into play to show that before the delivery it stood a certain amount of duty and came up to the standard required by the company.

OFFICE METHODS.

We noticed in the offices a simple way of keeping orders and also of keeping track of the work in the shop. This consisted of a spring-roller similar to that used for curtain-shades, mounted against the wall and provided

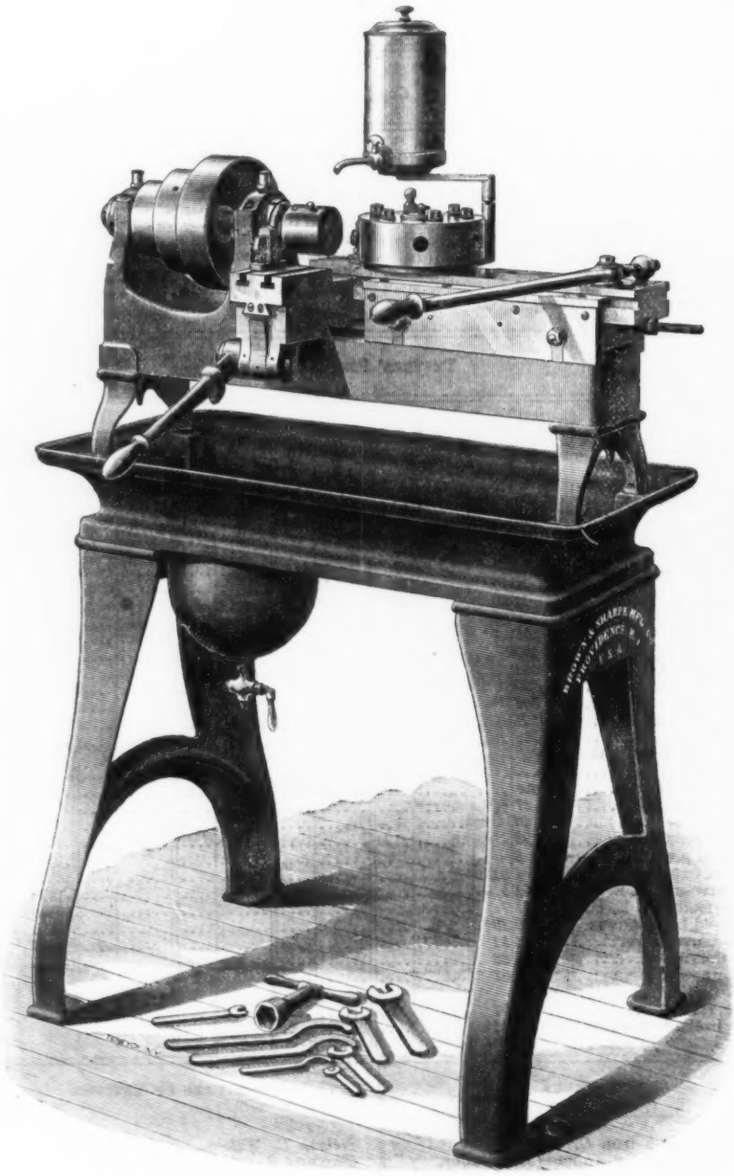
with a long slip of paper, ruled with vertical and horizontal lines, and having the following printed matter on it:

Date.	Number.	Agent.	Buyer.	Address	Use.	Engine.	Wheel.	When wanted.	Promised. Shipped.

When an entry is received in the office it is immediately placed upon this record, giving the information as far as then known. The superintendent of the shop consulting this record finds out what he is expected to do. If the engine is in stock it is immediately shipped, the line filled up accordingly, and then to show that that record had been fully completed a red-ink mark is drawn across it. This gives distinctly an indication that that particular entry has been filled, while at the same time it permits the easy reading of the record through the ink if necessary. Further than this, by unrolling the strip of paper it is seen at a glance if any one record has not been filled, as it would show the white strip across the paper. It is impossible with this system for a record to get away or out of sight.

Screw Machine.

The No. 2 screw machine here illustrated is made by the Brown & Sharpe Mfg. Company, of Providence, R. I. It is suitable for making screws and studs ordinarily used in a machine-shop, also for finishing small pieces or parts of machines from the rough bar or from forgings or castings. Some idea of the range of the machine may be obtained from the engravings of work done by it shown upon the opposite page. Eight tools can be used while the work is held by the chuck in one position, and uniformity and accuracy are thus insured and a saving of time is effected. The cost of the work is correspondingly reduced, and frequently is only 50 to 75 per cent. of that of the same work in an engine-lathe. The turret-head is secured in position by a simple and durable device. The spindle-boxes, $1\frac{5}{8}$ and $1\frac{1}{4}$ inches diameter and $2\frac{5}{8}$ and $2\frac{5}{8}$ inches long, are steel, hardened and ground inside and out. The spindle is also steel, its front bearing is hardened and both bearings are ground. The spindle-cone has three grades—$4\frac{1}{4}$ inches, $5\frac{3}{4}$ inches and $7\frac{1}{4}$ inches diameter, 2 inches face; size of hole through spindle, $\frac{7}{32}$ inch; number of holes in revolving-head, 6; diameter of holes in revolving-head, $1\frac{3}{16}$ inch; movement of revolving-head slide, $4\frac{1}{2}$ inches; length that can be milled, $3\frac{1}{2}$ inches; swing over slide-rest, $4\frac{5}{8}$ inches; swing over bed, $9\frac{5}{8}$ inches; length of bed, 31 inches. Counter-shaft has friction-pulleys 10 inches diameter, $3\frac{1}{4}$ inches face and should run 270 turns per minute. Weight ready for shipment, about 750 pounds. Floor-space, measured over extreme projections, 30 x 40 inches.



SCREW MACHINE.

The Latrobe Steel Works.

One important addition to the manufacturing industries of the State has recently been made at Latrobe, Pa. The works of the Latrobe Steel Company are thoroughly modern in every respect and equipped with the latest and best machinery for the manufacture of steel tires for locomotive and car-wheels. The machinery is constructed upon improved plans and original designs, most of which are by Mr. Julian Kennedy, their chief engineer, the result of investigation into the most successful processes both in this country and abroad. The buildings are capacious, well lighted and erected far enough apart to admit of enlargement for future growth. The company own 70 acres of ground, situated on the Loyal Hanna Creek, and near the main line of the Pennsylvania Railroad, with which the works are connected by a branch road. The melting shop, 175 feet long by 131 feet wide, is built entirely of iron, in which are two 15-ton Siemens-Martin furnaces, with drying-ovens, reheating and sand-calcining furnaces. Each furnace has its own ladle-crane and four 7-ton pit-cranes of the Aiken hydraulic type, all being operated from one pulpit. The ingots from the melting-furnaces, from each one of which a tire is made, are stored in the yard after being weighed, and if upon inspection it is found necessary are chipped, traveling-cranes being utilized for carrying them to and from the yard. When selected for orders, these ingots are taken to the forge, a building 300 feet by 131 feet, also of iron and charged into "continuous" furnaces, from which (by means of automatic crane) they are delivered to the 20-ton steam-hammer, the largest in the country. This hammer is a truly magnificent tool. Under it the ingot is upset or flattened by a few blows into a cheese about 6 inches thick, which is immediately punched. During this operation of punching, both the bloom and punches are handled by a most ingenious combination of hydraulic machines, with which a man and a boy do the work which ordinarily requires the labor of six or eight men, and do it, besides, more accurately and expeditiously. Almost human intelligence is exhibited by the centering crane, which, with the driver, manipulates the punches, blooms, &c., with a minimum loss of time and labor.

The bloom having been punched, it is transferred to a 7-ton steam-hammer, where it is hung upon a horn of an anvil and (being in the meantime rotated) is beaten upon its tread until its internal diameter is sufficiently enlarged to allow it to be placed on the rolls at the mill, during which operation the flange is also roughly formed. The bloom is then again subjected to a careful inspection, after which (if it passes muster) it is charged in

a heating-furnace, from which it is transferred to the tire-mill. This mill, like almost all the other special machinery about the works, was designed by Mr. Kennedy, and is probably more powerful and thorough in its work than any other which has yet been built. Its rolls compress the bottom and top edges, center and tread of the tire simultaneously, exerting a pressure of from 90 to 150 tons, as may be required. It is very rapid and accurate in its work, is driven by a double 26 x 42 inch engine of 1000 horse-power and turns out finished tires with unsurpassed smoothness and perfection.

At the hammers, heating-furnaces and mill and scattered thickly through the forge are numerous hydraulic cranes of the Aiken type, varying in their details, however, to suit their different services. An iron shed attached to this building contains the boilers of Babcock & Wilcox make, the feed-pump and pumps for supplying water under pressure to the hydraulic system all through the works. Tires which require no machine-work upon them are taken directly to the shipping-wharf. Those having to be bored or turned are sent to the machine-shop—a brick building 130 feet long by 60 feet wide—which is a model of its kind. Like the other buildings it is commodious and airy, is well lighted by large windows at the sides and ends, as well as sky-lights in the roof, and is warmed by a constant supply of fresh air heated by a steam-coil and forced to all parts of the building through a rotary blower.

The shop contains a 4-foot planer, three lathes of 20-inch, 38-inch and 48-inch swing, a radial drill, pipe and bolt cutters, tool-grinding machine and 11 special tire boring and turning mills, the latter being made by Wm. Sellers & Co., Incorporated. Of these mills five have tables 80 inches in diameter and six tables 60 inches in diameter. These tools are driven by a 14 x 20 inch engine of 140 horse-power and are covered by overhead railways and cranes carrying pneumatic hoists. A well equipped and organized tool-room serves the shop as well as the outside fitters, &c. In this shop is also a 100,000-pound testing-maching, in which a bar is broken from every heat cast before any of the metal is permitted to be used. Among the buildings not named are the storage-shed, carpenter shops, blacksmith and pattern shops, the whole comprising one of the best-equipped establishments to be found in any country. The officers of the company are Marriot C. Smyth, president; Walter H. Bryant, secretary; Ellwood W. Kember, treasurer; Guilliam Aertsen, manager; Julian Kennedy, chief engineer, and J. K. Griffith, superintendent.

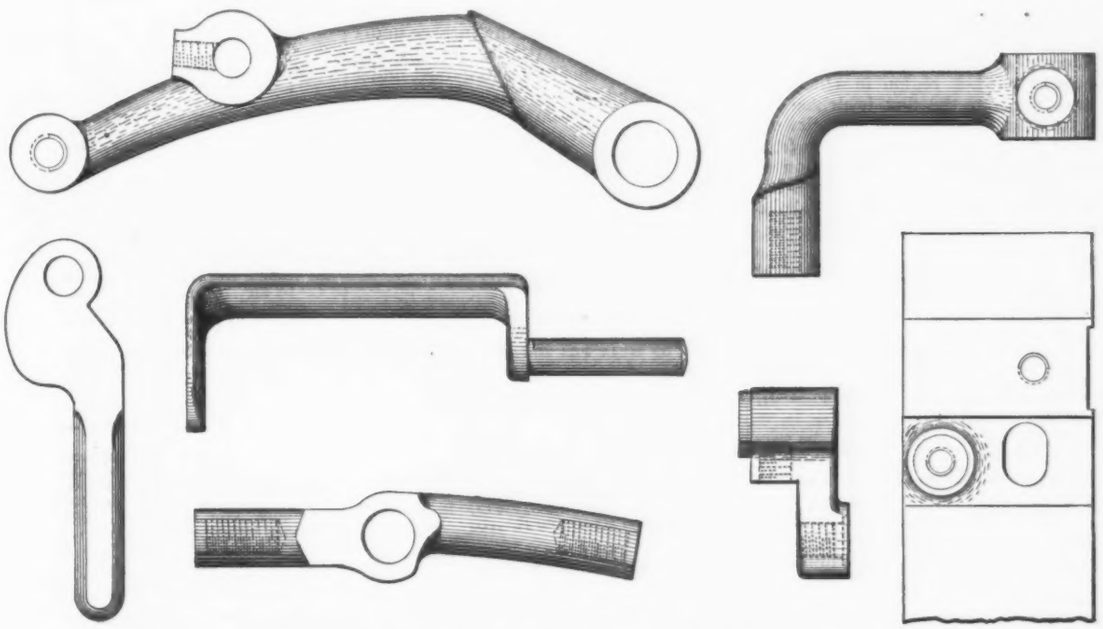
The Buena Vista Company.

An exceedingly comprehensive report by Dr. W. H. Ruffner, relative to the property of the Buena Vista Company, has just been published. Interest attaches to this report by reason of the description in it of the ore deposits of the Buena Vista Iron Company, a corporation who have recently contracted for the erection of a blast-furnace in Rockbridge County, Va., on lands donated for the purpose by the Buena Vista Company. The latter company have given the iron company a mining lease on a large area of ore lands at 15 cents per ton royalty on all ores mined within 20 years. The ores lie one to two miles from the furnace, to which they can be taken by down grades. Coke can probably be delivered from the Flat Top region for $3 per ton or less. Limestone is at hand. Two railroads, the Shenandoah Valley and the Richmond and Allegheny, pass close to the furnace-site and a third road is within eight miles. The ore-beds described are quite numerous, but most of them have not been developed sufficiently to enable their extent to be properly estimated. They have a general dip to the northwest at about an angle of 35°. Four beds occur among the great sandstone series, and the rest, except some limestone ores, lie in the upper Potsdam slates. The latter are looked upon as the chief resource for furnace use, being very plentiful and easily mined. Seventeen analyses were made of samples, including the worst ore as well as the best, with the following average result:

Metallic iron	51.411
Phosphorus	0.222
Silica	12.622

When charcoal furnaces were operated on this property the best ores then worked yielded an average of 53 per cent. of iron. No sulphur worthy of note was found in these ores. Calculations are given to show that dependence can be placed on the quantity of ore in the deposits for operating the furnace. The cost of making coke iron on this property is estimated at $8 to $12 per ton, with a freight rate of $2.50 to New York or other Eastern markets.

The Freight-Car Famine.—Officials of the Chicago and Rock Island road state that never before in the history of the road has there been such a demand for freight cars. Every car owned by the road is in use, with the addition of cars that could be borrowed, bought or improvised for the great traffic. Never has there been so much freight in transit and so great a bulk awaiting transportation. What is true of the Rock Island is true of the other Western roads. It is not uncommon to see ordinary flat-cars boarded up for the transportation of wheat. More corn is now in transit than was ever known before. This condition of affairs was predicted by well-informed observers some weeks since, after the enormous extent of the crops secured became known. The effect is being seen on the trade of car-builders, who are in receipt of orders almost constantly from railroad companies finding it impossible to depend any longer on their old stock of cars. The prosperity of car-builders seems now to be assured a long time ahead.



SPECIMENS OF WORK DONE BY SCREW-MACHINE.

The plans are completed for the six new iron stations which are to span the sunken tracks of the New York and Harlem Railroad, between Mott Haven and Williamsbridge. Each station will be supported by a framework resting on the tops of the stone walls on either side of the four tracks. The exteriors will be entirely of iron and will cost about $25,000 each The stations will be located as follows: Melrose, at 162d street; Morrisania, at 168th street; Central Morrisania, at Wendover avenue; Tremont, at Tremont avenue; Fordham, at Pelham avenue, and Williamsbridge, at Olin avenue.

The appeal of the Rio Tinto Copper Mining Company in their litigation with the Comptoir d'Escompte has been dismissed.

Calcined Lime as Furnace Flux.

Charles Cochrane, of Middlesborough, the most urgent, and so far as the accomplishment of excellent results are concerned the most successful, advocate of the use of calcined lime in the place of limestone as a flux in blast-furnaces, has recently in his presidential address brought before the Institution of Mechanical Engineers the latest results obtained at his Ormesby works. We quote from it the following:

When limestone is employed as a flux there are two sources of carbonic acid: 1, that contained in the carbonate of lime CaO CO_2, which has necessarily to be evolved in contact with red-hot coke, because at less than a red heat it is impossible to separate the carbonic acid from the lime, and, 2, that evolved in the process of reduction of the ore or iron-stone, which, if previously calcined, so as to become peroxide of iron, undergoes the following reaction: $Fe_2O_3 + 3CO = Fe_2 + 3CO_2$. Now, according to the construction of the furnace and the more or less imperfect appliances at command, much or little of the latter, which will be called the carbonic acid of reduction, may be evolved in the same red-hot region in which the carbonic acid from the flux is driven off. In old furnaces of very small capacity extravagant waste of fuel took place from this very cause—namely, the evolution of carbonic acid of reduction in the red-hot region, owing to the plunging of the iron-stone down into that region before its complete reduction had been effected in a higher and cooler region. How great could be the mischief will appear by assuming the extreme case of a furnace so badly constructed that the whole of the reduction of the peroxide of iron shall take place in the red-hot region. From the formula $Fe_2O_3 + 3CO = Fe_2 + 3CO_2$, or $(2 \times 28) + 3 \times 8 + 3 \times (6 + 8) = (2 \times 28) + 3 \times (6 + 16)$, it will be seen that for the reduction of 56 hundredweight of iron there are required 18 hundred-weight of carbon as carbonic oxide, and 56 is to 20 as 18 is to 6.43; therefore 6.43 hundred-weight of carbon are required for the reduction of 20 hundredweight of iron from its assumed condition ot peroxide. But inasmuch as 20 hundredweight of pig-iron contain only 18.80 of pure iron, the carbon required per ton of pig-iron will be $6.43 \times 18.80 \div 20 = 6.04$ hundred-weight. Now, suppose the whole of this carbon, which should in a perfect furnace pass away as carbonic acid, became carbonic oxide, it would first absorb 6.04 hundred-weight of carbon for conversion into carbonic oxide according to the reaction $CO_2 + C = 2CO$; and the heat to be furnished at the tuyeres would be $6.04 \times 1.26 = 7.61$ hundred-weight of carbon burnt into carbonic oxide. Hence a total loss would arise of $7.61 + 6.04 = 13.65$ hundred-weight of carbon per ton of pig-iron.

It was in the direction of reducing this mischievous tendency that, at Middlesborough especially, important economies ensued on increasing the capacity of the blast-furnace from 6000 or 7000 cubic feet to 20,000 cubic feet or more. Thereby more time was given for the reduction of the iron-stone; so that it became more possible to secure, in the analysis of the escaping gases when employing limestone as flux, a nearer approach to the presence of the entire quantity of carbonic acid of reduction and in certain cases even the entire quantity. Indeed, M. Grüner was quick to discover in Sir Lowthian Bell's experiments the presence in some cases of a little more carbonic acid than was due to the possible formation of carbonic acid by the reduction of all the iron-stone; and the excess must have proceeded from the evolution of carbonic acid from the limestone. As the writer has himself on several occasions since confirmed M. Grüner's observation, he now deems such increase of carbonic acid beyond the carbonic acid of reduction to be the result of a trifling wave of carbonic acid displaced from the surface of the limestone just before it plunges into the red-hot coke region. The amount is so little as not to disturb the main conclusion that the carbonic acid of the flux takes up a weight of carbon practically equal to that which it already contains. Nor must it be lost sight of that in thus taking up carbon and becoming 2CO the result it produces is not altogether prejudicial; for the carbonic oxide so formed enriches the deoxidizing gas of the furnace and promotes the more complete deoxidation of the iron-stone in the cooler region above, so as to make it possible to attain to a perfect reduction thereof without absorption of carbon by carbonic acid of reduction.

At this stage it may be interesting to refer to the effect of displacing the carbonic acid from the flux by calcining the latter before employing it in the blast-furnace. The following is a comparison between the results obtained at the same furnace under the two different conditions, and will fully illustrate the benefit to be obtained under favorable conditions by the substitution of lime CaO for limestone CaO CO_2 in a blast-furnace of capacity adapted to the materials employed, although there may seem room for the little regret that the balance of heat received (Table 1) and heat expended (Table 2) is not somewhat closer than here appears.

TABLE 1.—*Ormesby Iron Works, Middlesborough. Blast-Furnace of 20,454 Cubic Feet Capacity and 76 feet Hight. Comparison Between Working on Limestone and on Lime Respectively as Flux.*

SUPPLY OF HEAT PER TON OF PIG-IRON MADE

		On limestone. Per cent.	On lime. Per cent.
Chemical composition of the escaping gases. By volume	Nitrogen N	58.28	59.90
	Carbonic acid CO_2	9.25	9.79
	Carbonic oxide CO	30.89	28.95
	Hydrogen H	1.58	1.36
By weight.	Nitrogen N	56.19	57.43
	Carbonic acid CO_2	14.04	14.80
	Carbonic oxide CO	29.66	27.68
	Hydrogen H	0.11	0.09
Ratio of CO_2 to CO by weight, ratio		0.43	0.535
Temperature of blast, 1485° F. and 1409° = centig.		807°	765°
Temperature of escaping gases, 621° F. and 574° = centig.		327°	301°
		Cwts.	Cwts.
Coke consumed per ton of pig-iron		23.28	19.49
Deduct: Ash 7.70 and 7.65; Sulphur 0.84 and 0.90; Moisture 0.53 and 1.95	Per ct. 9.07 and 10.50 =	2.09	2.05
Net carbon in coke consumed per ton of pig-iron		21.19	17.14
Limestone consumed per ton of pig-iron		13.18	* 7.86 / *12.28
Deduct foreign matter in flux, 3½ and 3.71 per cent		0.46	0.45
Net pure carbonate of lime CaO CO_2		12.72	11.83

* When working on lime the actual weight of flux charged into the furnace per ton of pig-iron made was 7.86 hundred-weight of impure lime, resulting from the calcination of 12.28 hundred-weight of raw limestone. The latter was found by an analysis to contain 3.71 per cent. of foreign matter, amounting therefore to 0.45 hundred-weight, and the net pure carbonate of lime was accordingly $12.28 - 0.45 = 11.83$ hundred-weight of CaO CO_2, which contained $11.83 \times 22 \div 50 = 5.21$ hundred-weight of CO_2. But instead of the whole of this CO_2 being expelled from the limestone in the calcining kiln, the actual weight driven off was only $12.28 - 7.88 = 4.42$ hundred-weight. Consequently there remained in the lime used as flux $5.21 - 4.42 = 0.79$ hundred-weight of CO_2; and this unexpelled CO_2 contained $0.79 \times 6 \div 22 = 0.22$ hundred-weight of carbon, which corresponds with 1.83 hundred-weight of CaO CO_2.

Carbon contained in flux, $12.72 \times 6 \div 50$ and $*0.79 \times 6 \div 22$	1.52	*0.22
Total carbon supplied into furnace per ton of pig-iron, $21.19 + 1.52$ and $17.44 + 0.22$	22.71	17.66
Deduct carbon absorbed by pig-iron	0.60	0.60
Net carbon for producing joint CO_2 and CO	22.11	17.06
Carbon required per ton of pig-iron for perfect reduction	6.04	6.04
If all CO_2 passed away without change, total CO_2 in escaping gases would be $(1.52 + 6.04 = 7.56) \times 22 \div 6$	27.72	....
and $(0.22 + 6.04 = 6.26) \times 22 \div 6$	....	22.96
While there would then pass away as CO $(22.11 - 7.36 = 14.55) \times 14 \div 6$	33.95	...
and $(17.06 - 6.26 = 10.80) \times 14 \div 6$	....	25.20
	Ratio.	Ratio.
In that case the furnace would be working perfectly with ratios CO_2 to CO = 27.72, 33.95 and 22.96 ÷ 25.20	0.816	0.911
But the actual working ratios given above were	0.473	0.595
	Cwts.	Cwts.
This reduction of ratios, as will be explained further on, is attended with transfer of carbon from condition of CO_2 to that of CO, amounting to	2.44	1.93
The transfer, as will also be explained, is derived from the two following sources:		
Carbon from CO_2 of flux, as above	1.52	0.22
Carbon from CO_2 of reduction, by difference	0.92	1.71
Total carbon transferred per ton of pig-iron, as above	2.44	1.93
Moisture in atmosphere per cubic foot grains	4.776	3.243
Weight of air supplied into furnace is found as follows:	Cwts.	Cwts.
Carbon supplied for producing CO_2 and CO, as above	22.11	17.06
Deduct carbon transferred from CO_2 of flux and of reduction, as above	2.44	1.93
Net carbon to be converted into CO by air	19.67	15.13
Weight of oxygen required $19.67 \times 8 \div 6$ and $15.13 \times 8 \div 6$	26.23	20.17
Weight of nitrogen required $26.23 \times 77 \div 23$	87.82	....
and $20.17 \times 77 \div 23$	....	67.52
Total weight of dry air required per ton of pig-iron	114.05	87.69
Total heat supplied into furnace by blast, reckoned in hundred-weights of carbon burnt into CO, each unit of carbon thereby developing 2473 heat-units, and specific heat of air being 0.239, $\frac{114.05 \times 807° \times 0.239}{2473}$ and $\frac{78.69 \times 765° \times 0.239}{2473}$	....	8.89	6.48
If to this heat so measured be added the actual carbon contained in the coke	21.19	17.44
and also the carbon in the flux	1.52	0.22
There is a total of carbon to be accounted for as supplied into the furnace, both directly as carbon and in its equivalent of heat carried in by the hot blast, amounting per ton of pig-iron	31.60	24.14

TABLE 2.—*Ormesby Iron Works, Middlesborough. Blast-Furnace of 20,454 Cubic feet Capacity and 76 feet Hight. Comparison Between Working on Limestone and on Lime Respectively as Flux.*

EXPENDITURE OF HEAT PER TON OF PIG-IRON MADE.

	Working on Limestone. Cwts.	Lime. Cwts.
Gases escaping at tunnel-head are found as follows:		
Net carbon for producing CO_2 and CO, as before	22.11	17.06
Deduct carbon escaping in CO_2, $6.4 - 0.92$ and $6.4 - 1.71$	5.12	4.33
Leaves carbon escaping in CO	16.99	12.73
CO_2 escaping $5.12 \times 22 \div 6$ and $4.33 \times 22 \div 6$	18.77	15.88
CO escaping $16.99 \times 14 \div 6$ and $12.73 \times 14 \div 6$	39.64	29.70
Nitrogen escaping, as before	87.82	67.52
Total weight of dry gases escaping	146.23	113.10
Heat carried away by waste gases, reckoned in hundred-weights of carbon burnt into CO, each unit of carbon thereby developing 2473 heat-units, and specific heat of escaping gases being 0.237, $\frac{146.23 \times 327° \times 0.237}{2473}$ and $\frac{113.10 \times 301° \times 0.237}{2473}$	4.58	3.26

Carbon absorbed by pig-iron, as before	0.60	0.60
Carbon absorbed by Co_2 of flux 1.52 and 0.22	2.44	1.93
Carbon absorbed by CO_2 of reduction 1.92 and 1.71		
Extra carbon needed to be burnt into CO at tuyeres for meeting loss of heat due to unburning of CO_2 into CO, 2.44 × 1.26 and 1.93 × 1.26	3.07	2.43
Heat required to drive off CO_2 from flux, reckoned in hundred-weights of carbon, burnt into CO, each unit of flux requiring 373 5 heat-units to drive off CO_2, 12.72 × 373.5 ÷ 2473 and 1.83 × 373.5 ÷ 2473	1.92	0.27
Decomposition of moisture in blast	1.33	0.73
Carbon remaining as CO_2 and passing away as such in escaping gases is 6.04 — 0.92 and 6.04 — 1.71	5.12	4.33
The slag, weighing about 32 hundred-weight per ton of pig-iron, requires for its melting 550 heat-units per unit of slag, or 32 × 550 ÷ 2473 of carbon burnt to CO	7.11	7.11
Melting of the iron requires	0.90	0.90
Evaporation of water from coke	0.03	0.09
Sundries, including loss of heat by tuyere water, radiation from sides of furnace and tuyere houses, &c	3.78	3.30
Total carbon accounted for as expended	30.88	24.95
Error	+0.72	— 0.81
Total carbon to be accounted for as received	31.60	24.14
Consumption of calcined iron-stone per ton of pig-iron, hundred-weight	50.13	50.00
Make of pig-iron per month, tons	2,141	2,453
Quality of pig-iron, No	3.25	3.31
Blast, pressure per square inch at tuyeres, pounds	3.87	3.73
Area of tuyeres, square inches	142	142

In these comparative accounts of receipts and expenditure of heat it will be noticed that in working on limestone the expenditure falls short by 0.72 hundred-weight of carbon of the total heat received in fuel and heated blast and reckoned in carbon burnt to carbonic oxide, while in working on lime the expenditure account shows an excess of 0.81 hundred-weight of carbon over that which was received. There are errors on either side amounting to 2½ and 3 per cent. respectively, to which calculations of this kind are liable, owing to the impossibility of recording accurately all the conditions under which a blast-furnace works. Imperfectly calcined iron-stone, for instance, will contain more or less carbonic acid, which if at the surface will pass away as such, but if imprisoned in the core of a large piece of iron-stone will descend into the red-hot region of the blast-furnace, there to be liberated with absorption of carbon and resultant loss of heat. Such fluctuations in the iron-stone would produce some influence upon the ratio of carbonic acid to carbonic oxide; but all things considered the above errors of 0.72 and 0.81 hundred-weight respectively might fairly be spread over the whole of the expenditure account, indeed probably over both receipt and expenditure accounts, and so become inappreciable while leaving the salient points of the account undisturbed.

It will be seen that when working on lime, with even an imperfect calcination of the flux, an economy was obtained of 21.19 — 17.44 = 3.75 hundred-weight of carbon; whereas the theoretical saving should have been only 2.94 hundred-weight of carbon, according to the weight of carbon in the carbonic acid displaced from the flux—namely, (1.52 — 0.22 = 1 30) × 1.26 + 1.30 = 2.94.

The calculation which needs explanation in Table 1 is the one whereby, from an analysis of the gases and from a knowledge of the carbon consumed per ton of pig-iron and of the unexpelled carbonic acid in the flux, it is possible to arrive at the exact mischief done in the red-hot coke region by each of the two sources of that mischief—namely, the carbonic acid of reduction and the carbonic acid from the flux. In his last paper read before this institution in January, 1883, the author showed how this could be accomplished by a laborious method of calculation and by special tables, but continued study has enabled him to simplify the calculation and by a simple algebraical formula to test the effective working of a blast-furnace by accounting in the form of an expenditure column for every unit of carbon consumed, whether in the heating of the blast or in the carbon burnt within the furnace. His own practice is to account in this expenditure for all fuel by reducing it to units of carbon burnt to carbonic oxide, each unit thereby developing 2473 centigrade units of heat. In this way he hopes to have made a complicated problem clear.

Taking the ratio 0.473 determined by analysis as that of carbonic acid to carbonic oxide in the escaping gases when working on limestone, we begin by ascertaining what this ratio should have been had there been no reconversion whatever of carbonic acid into carbonic oxide. Then would the furnace have worked perfectly, and the ratio would have been found as follows: The net carbon available for producing joint carbonic acid and carbonic oxide has been found in the foregoing statement to be 22.11 hundred-weight per ton of pig-iron. In perfect work all carbonic acid should pass away as such, and the total quantity produced in the furnace will be that from the 6 04 hundred-weight of carbon for the reduction of the iron-stone and that from the 1.52 hundred-weight of carbon in the flux, namely:

		Cwt. of carbonic acid.
Carbon for reduction	6.04 × 22 ÷ 6 =	22.15
Carbon of flux	1.52 × 22 ÷ 6 =	5.57
Total carbon	7.56 × 22 ÷ 6 =	27.72

If these 7.56 hundred-weight of carbon all appeared in the escaping gases, the balance should pass away as carbonic oxide—namely, 22.11 — 7.56 = 14.55 × 14 ÷ 6 = 33.95 hundred-weight of carbonic oxide. Therefore the perfect ratio of carbonic acid to carbonic oxide would be 27.72 ÷ 33.95 = 0.816, but the actual ratio determined by analysis was only 0.473, and has been lowered from the perfect to the actual by the transfer of a certain amount of carbon from the condition of carbonic acid to that of carbonic oxide. Let x be the weight of the carbon so changed; then from the total carbonic acid possible in perfect work there will have been subtracted $\frac{22}{6}x$, and to the total carbonic oxide possible in perfect work there will have been added $\frac{14}{6}x$. Hence the new ratio of carbonic acid to carbonic oxide will be $(27.72 - \frac{22}{6}x) \div (33.95 + \frac{14}{6}x) = 0.473$. Whence x = 2.44 hundred-weight, as taken in the foregoing Table 1 for the quantity of carbon transferred from the condition of carbonic acid to that of carbonic oxide per ton of pig-iron.

In like manner where lime was employed containing 0.22 hundred-weight of carbon as carbonic acid unexpelled, the perfect ratio of carbonic acid to carbonic oxide would have been 22.96 ÷ 25.20 = 0.911; whereas in actual work it fell to 0.535, showing that the carbon transferred from the condition of carbonic acid to that of carbonic oxide amounted to 1.93 hundred-weight per ton of pig-iron. It is most important to notice the sources of these two different transfers. Obviously it might fairly be supposed that there should have been a difference between them of 1.52 — 0.22 = 1.30 hundred-weight; so that the transfer of 2.44 hundred-weight in the limestone furnace should have been lowered to 1.14 hundred-weight in the lime furnace; whereas it appears at 1.93 hundred-weight. Let us therefore examine how the 2.44 and 1.93 are made up in the respective cases of working with limestone and with lime.

	Lime-stone.	Lime.
Carbon transferred from carbonic acid of flux	1.52	0.22
Carbon transferred from carbonic acid of reduction by reason of its evolution in region of red-hot coke	0.92	1.71
Totals	2.44	1.93

The use of lime has therefore failed to accomplish some of the benefit which the author ventured to hope and predict in January, 1883, thus showing that its employment is not an unmixed good. For through a combination of causes the reduction of iron-stone when working with lime as flux has been less effective to the extent of 1.71 — 0.92 = 0.79 hundred-weight of carbon per ton of pig-iron, equivalent in the present comparison to a loss of 0.79 × 1.26 + 0.79 = 1.79 hundred-weight of carbon per ton of pig-iron. To make this point clearer, in the case of working on limestone the proportion of iron-stone reduced in the cooler regions of the furnace out of contact with red-hot coke was 50.13 × 5.1 ÷ 26.04 = 42.49 hundred-weight per ton of pig-iron; while there passed down into the red-hot zone for reduction there 50.13 × 0.92 ÷ 6.04 = 76.4 hundred-weight. For working on lime the corresponding figures are 50 × 4.33 ÷ 6.04 = 35.84 hundred-weight and 50 × 1.71 ÷ 6.04 = 14.16 hundred-weight. In neither of these cases does the dreaded proportion appear of one volume of carbonic acid to two volumes of carbonic oxide; for from the analysis given in Table 1 it is seen that the proportion when working on limestone was only 9.25 to 30.89 or 1 to 3⅓, and when working on lime 9.79 to 28.95 or 1 to 3 nearly. The consideration of these volumetric proportions may therefore be dismissed as inoperative in the present instances.

What, then, are the causes of the diminution in the weight of carbonic acid of reduction—that is, of the increase in the weight of carbon transferred from the carbonic acid of reduction into the condition of carbonic oxide—despite the removal of 85 per cent. of the carbonic acid from the lime used as flux? The causes of this disappointment when working on lime are twofold:

Firstly, as intimated at the outset, when limestone is used all or nearly all the carbonic acid it contains is necessarily converted into carbonic oxide, thus increasing and prolonging the activity of the reducing zone in a cooler region, while at the same time this cooler region is extended downward by the absorption of the heat due to the unburning of the carbonic acid to carbonic oxide, thus protracting or prolonging the period of reduction of the iron-stone within the extended reducing region, so that the employment of limestone is not an unmixed evil.

Secondly, when lime is used the weight of carbonic oxide is comparatively diminished, the cool reducing zone is curtailed in its depth and the total volume of gases is greatly diminished by reason of the greatly diminished consumption of fuel in the furnace, due to the very economy secured by the expulsion of carbonic acid from the flux. When working on lime the iron-stone undergoing the process of reduction is thus subjected both to the passage of a smaller quantity of reducing gas over it and to that passage during a shorter period of time before entering the red-hot zone, which zone by the use of lime has been raised somewhat higher in the furnace.

To reduce the above conditions to actual figures, we have when working on limestone, according to Table 2, a weight of 146.23 hundred-weight of gas per ton of pig-iron, which are passing over the materials entering the furnace, and of which 39.64 hundred-weight consist of carbonic oxide, or 27 per cent. of the total. When working on lime we have only 113.10

hundred-weight of gas per ton of pig-iron passing over the iron-stone as it enters the furnace, of which only 29.70 hundred-weight are carbonic oxide, or 26 per cent. of the total. It will thus be seen that there is only a trifling difference in the percentage of carbonic oxide in the total gases as they leave the furnace; so that, in explanation of the diminished reduction of iron-stone in the cooler reducing regions of the furnace when working on lime, there remains the important fact that the materials from which a ton of iron is produced are exposed to the influence of only 29.70 hundred-weight of carbonic oxide when lime is employed as flux, instead of to that of 39.64 hundred-weight when limestone is employed—a proportion of about 3 to 4, or 25 per cent. less carbonic oxide when working on lime.

But while disappointment has to be confessed to the extent indicated, there are one or two conclusions to be drawn from the above comparisons which will well reward further consideration.

The air required for consuming the coke per ton of pig-iron is seen from Table 1 to have been in the case of limestone 114.05 hundred-weight and with lime only 87.69 hundred-weight, showing a direct economy of 26.36 hundred-weight of air, or 23 per cent., while with the same pressure of blast and the same tuyere area the furnace when working on lime turned out 2453 tons of iron per month, against 2141 tons per month when working on limestone (Table 2). It is in consequence of this increase in the output that the item of sundries in the statement of expenditure of fuel (Table 2) has been reduced from 3.78 with limestone to 3.30 with lime. It is not generally known how far the constancy of the loss by radiation and by tuyere-water, &c., affects the consumption of fuel by reason of increased output. Within certain limits this explains the fact that extra driving may be and is accompanied by reductions of fuel consumed to make a ton of iron.

Ocean Lane Routes.—The long-mooted question respecting the practicability of prescribing a "steam lane" for ocean traffic has been thoughtfully considered by the Marine Conference at Washington, and the committee having the subject in charge report that while there is a demand for the establishment of a definite route, there is a difficulty in making the recognition of such a route arbitrary. "The committee believe that the voluntary establishment of and adherence to particular routes by the different steam-ship companies for different seasons of the year is very desirable; that such action by the steam-ship companies, with the experience to be gained thereby, would be quite essential before any concerted action by the maritime powers could be profitably taken. The committee strongly recommend that the companies interested should, by mutual agreement after consultation together, establish routes for the different lines and make them public, in order that the hydrographic offices of the various governments may publish them for the information of navigators."

The Thomson Electric Welding Company, of Boston, under recent date write the Pittsburgh Reduction Company, of Pittsburgh, as follows: "We have made tests of the aluminium which you are producing and find that it welds without the least difficulty. We have a special machine built for this work. The welds are very rapidly made and submit to the various tests and with most satisfactory results. We can weld the aluminium of any section or size. It simply depends upon the class of machine built for the purpose and the horse-power required."

THE WEEK.

The exports of live-stock from Canada by the St. Lawrence route have been quite extraordinary during the season just closed. The totals are given by the *Meat Traders' Journal* as follows:

	Cattle.	Sheep.
1889	85,396	58,834
1888	61,092	45,851
1887	65,241	34,193

This year's cattle exports are therefore 24,304 in excess of 1888, while the increase in sheep is 12,983. The average price obtained all around is placed at £12. 10/ per head. Cattle exports from the United States for the single month of November were valued at upward of $2,000,000.

The rubber market in New York is much disturbed by advices from Brazil that the provisional Government has granted a special concession to the Companhia Mercantil at Para, to take effect January 1, which gives them ¾ per cent. advantage over other firms in the export trade. New York firms will protest. The price of rubber is now about 73 cents per pound

Boston papers speak of the industrial growth of New England. A reference to details shows that shoe manufacturing and textiles are the special features.

The proposed sale of the South Carolina phosphate beds to a supposed English syndicate is strenuously opposed by local manufacturers and others directly interested.

New Zealand is making rapid progress. The population numbers 607,000, and the exports exceed $39,000,000 for the last year, of which about $15,500,000 represents the value of wool. Frozen meat makes another large item. The industrial returns show that the approximate value of the buildings, machinery and plants generally is estimated at $28,500,000.

An 8-inch gun, weighing 14¼ tons, the first large gun made for use in the army, was shipped from the Watervleit Arsenal and tested in Washington with entire success.

New York and Brooklyn have a $16,000,000 bridge. The interest on its cost is enormous. But it pays.

It is stated that the brick output in the United States during 1889 will reach 10,000,000,000, valued at $75,000,000.

At the recent convention of brick manufacturers in Boston, opinions differed as to whether color is an indication of "fire property."

The fierce rivalry between St. Paul and Minneapolis is a theme for remark by a correspondent: "St. Paul is the older city and for a long time the race for supremacy was neck and neck. In 1860, when St. Paul had 10,600 inhabitants, Minneapolis had 5800; in 1880 the score stood 41,400 and 46,800. To-day Minneapolis claims 210,000 or 215,000 inhabitants. St. Paul leads in wholesale and Minneapolis in retail trade; both are energetic, hopeful and jealous of each other with a jealousy that affords much amusement to outsiders, but does not keep them from co-operating with each other in works for their mutual advantage. They are growing rapidly together, their municipal boundaries touch, though their business centers are 10 miles apart, and the prediction is made that before many years they will join in government as they now do in boundaries."

A Pittsburgh dispatch states that a firm of manufacturers of lamp-chimneys in that city have just shipped "a large consignment of their wares to England," and that they were enabled to do so by the superior quality of their product. These exports have for some time past indicated a growing foreign demand.

James D. Leary, of Joggins raft fame, the well-known New York contractor and lumber merchant, has just entered into a big contract to build dry and wet docks in the harbor of St. John's, N B. The scheme will involve the expenditure of some millions of dollars.

The Providence and Stonington Steamship Company paid $95,820 in dividends last year.

By mixing sugar with sorghum syrup farmers in Kansas were induced to subscribe for bonds in aid of mill enterprises and are said to have been swindled out of $150,000.

Transactions in real estate in New York City this year have been on a large scale. The number of conveyances from January 1 to November 30 inclusive was 13,841, as compared with 11,034 during the same period in 1888, while in value this year they aggregated the enormous sum of $246,151,732, as against $197,813,431; an increase of $48,338,301, or nearly 20 per cent., over 1888. The Tax Commissioners' report just issued gives the total value of the real and personal property of the county for the year 1889 as $1,615,244,434, or 45.2 per cent. of the wealth of the entire State, as against 44.9 per cent. for the year 1888. The entire amount of taxes to be collected is $31,145,432.45.

In order to evade the discriminating duty of 10 per cent. imposed by the United States against imports into this country in Mexican vessels the Mexican steam-ship lines to Lower California have changed their nominal allegiance to Colombia and Chili. Despite the recent recommendations of Minister Ryan there are no signs of a return to the reciprocity treaty of 1883.

There are some premonitions of a conflict between the telegraph and telephone interests, but the demand for both kinds of service is growing and will continue to increase.

Copper sheets which had been immersed for 12 days in the waters of Newtown Creek, Long Island, where the oil refineries are located, have been on exhibition at the Maritime Exchange to disprove the assertion frequently heard that the sheathing of vessels moored near establishments of that character suffers from corrosion. The metal did not appear to have been in the least affected

The Baltimore and Ohio Railroad will establish an enormous freight-distributing depot at Berlin, Md., on a tract of 500 acres just purchased. Traffic to and from the West and New York will be handled there, in breaking bulk. Foreign export freight will be held at Berlin until the steamers are ready at the Baltimore piers to take in their cargoes, and then it will be rushed through.

The new bridge across the Ohio River, below Pittsburgh, at Brunot's Island, is so far advanced that the suspended structure will soon be commenced. Other improvements contemplated at Wall's Station and vicinity will involve a total expenditure of near $3,000,000.

At railway centers in Kansas the pressure of freight for transportation is unprecedented. There is more corn moving than ever before.

Persia has opened a national bank with money obtained from England.

A scheme to establish a huge dead-meat market at Three Rivers, in Canada, is on foot in London, to be immediately capitalized with $1,500,000. A glowing prospectus is published. At the present time

90,000 head of cattle are shipped alive from Canada to England. It is a noticeable coincidence that English capitalists are seeking to establish a dead-meat depot in the Argentine Republic on a corresponding scale.

Chicago has elected nine trustees or drainage commissioners, authorized to expend an amount of money estimated at from $15,000,000 to $50,000,000 in improving the sanitary condition of the city. The law gives them power to employ 10,000 men a year for seven years.

New Orleans as a business mart claims to have improved this year in every respect and has more confidence in the future. The city has done a larger business than for years past, has received more cotton and other products, its clearances are larger and its manufactures have prospered.

The Mexican Government has renewed the contract with the Pacific Mail Company's steamers for two years from January 1. The steamers will make two round trips monthly between San Francisco and Panama, touching at Mexican ports.

Canadians are much worried by the invasion of fine flour from the States and call either for an increased duty or a lower freight rate between Minneapolis and Toronto. Premier Greenway at Winnipeg, has been interviewed, but as the people of Manitoba have been exclaiming against the existing tariff the question becomes perplexing.

More torpedo-boats are demanded for naval purposes, according to Secretary Tracy, and Mr. Hale's bill for the construction of five vessels of this class brings up the subject directly before Congress.

One of the largest flouring-mills in Minneapolis, known as "Pillsbury A," is described by its managers as the eighth wonder of the world. It grinds 9,500,000 bushels of wheat yearly, more, it is claimed, than any other two mills in existence. It can produce 7000 barrels of flour per day; it has produced more, and ordinarily turns out 6000 barrels per 24 hours. For the whole mills of the city 300 carloads a day are necessary to keep them in wheat. They consume in each 24 hours some 190,000 bushels of grain, or the product, taking the United States average as a basis, of 12,000 acres of land.

The Globe Refining Company's plant, in Pittsburgh, which was long a thorn in the side of the Standard Oil Company, is sold to the latter for $4,000,000, as stated "on the authority of an employee."

A remarkable phase in the recent industrial developments in China is the increasing number of Japanese employed in engineering works and manufactures. The latter gained their advantage through the industrial schools established by the Government, which China now seeks to imitate.

The explorer Henry M. Stanley predicts the rapid growth and prosperity of Eastern Africa.

The Montreal *Gazette* makes the following comparison of the value of exports or surplus products of the United States and Canada in 1888, with the object of showing that it is simply fatuity to suppose that farmers in the Dominion can derive any advantage from commercial union:

	United States.	Canada.
Agriculture.....	$500,840,000	$40,155,000
Manufactures	130,300,000	4,161,000
Mines	17,993,000	4,110,000
Forest.....	23,991,000	21,302,000
Fisheries	5,518,000	7,793,000

The argument adduced is that when the home supply of an article exceeds the demand the price is determined by the foreign market—that is to say, when Canada and the United States, for instance, have a surplus of wheat available for export, the price not only of the exportable remnant, but of the whole crop, will be regulated by the state of the foreign market.

Frederick Krupp, the head of the great metal and gun foundry, has established a fund of $100,000 to enable his employees to build their own houses.

The Chicago Auditorium or opera-house, just completed at a cost of $3,000,000, claims to rank among the finest structures on the continent. The building has frontage on three streets, a total of 709 feet, 187 eastern, 361 southern and 161 western. Its main portion is ten stories high, rising 144 feet above the street level, while the tower reaches an altitude of 240 feet. The exterior walls are of Minnesota granite and Bedford stone, and the large pillars supporting the arches are of Maine granite.

"The growth in the exports of petroleum from Batoum," says the London *Ironmonger*, "shows a steadily increasing demand for Russian oil, especially in India, China and Japan. The shipment of petroleum products grew from 263,000 tons in 1887 to over 450,000 in 1888, of which 109,000 tons was for the market above named, India taking two-thirds of the amount. In 1887 there were but nine steamers engaged in carrying oil in bulk from Batoum to Odessa and foreign countries. In 1888 the number so employed was 22."

The Australian colonies, seven in number, now have over 3,000,000 people. Each has its own legislature, making its own tariff and commercial regulations.

A special correspondent at Pekin says: "Li Hung Chang and other high authorities have presented to the throne a lengthy memorial advising speedy and energetic legislation to counteract the exclusion of Chinese immigrants into the United States and Australia, and it is said that in response the Emperor will issue a proclamation granting special privileges to such nations as freely admit Chinese subjects into their territory."

Judge Andrews, of the Supreme Court in this city, dissolved the injunction preventing the city authorities from taking down the electric-light wires. Commissioner of Public Works Gilroy at once ordered the poles to be cut down. Judge Barrett, in his opinion, says that if the system is dangerous to human life its operation is without legislative authority, expressed or implied. Yet the electric companies have acquired property rights of which they cannot be deprived without just compensation A legal representative of the Brush and United States Electric Light companies says that since the Andrews injunction was granted his corporations have spent $100,000 in stringing new and improved overhead wires.

The Des Moines (Iowa) *Register* cautions Congress against indiscriminate legislation in aid of Western irrigation schemes. The editor says: "It is well known that in the past four years public agents and officers by foul means have gobbled up vast tracts of our public domain. And if they can now have these lands redeemed from sterility by irrigation, and made the best farm lands in the world, it will be a scheme worthy of the highest talent of any expert swindlers." It may be stated as a rule that for lands worth irrigating there is no lack of capital ready for investment, without asking for a Government appropriation.

Consul J. S. Farrar, who represents this Government at Port Sarnia, in Canada, describes the great St. Clair tunnel at that point, and says: "The construction by the Grand Trunk Railway Company of the tunnel under the St. Clair River between Port Sarnia and Port Huron, Mich., has slowly progressed during the past two years. The undertaking has proved to be difficult and expensive, involving an immense outlay of money expended in preliminary and experimental work. The length of the tunnel will be 6800 feet, of which 2310 feet will be under the river, 2160 feet under dry land on the Canadian side and 2330 feet under dry land in Michigan. The depth of the lowest part of the tunnel below the surface of the water will be 88½ feet. In cross-section the tunnel will be circular, with a clear internal diameter of 20 feet. The lining will consist of cast-iron, of which about 6000 tons have been manufactured and delivered upon the ground ready for use."

The official figures show that the traffic passing through the Sault Ste. Marie Canal this year has been 18 per cent. greater than in 1888, measured by the freight tonnage, and 40 per cent. in the vessel tonnage. A Western paper says a continuation of this rate of increase for five years more would make the actual freight tonnage of 1894 not less than 18,000,000 tons, or 3,000,000 tons a month. The heaviest month's traffic in the history of the Suez Canal was not more than one-third of that enormous amount of freight, and 3,000,000 tons a month will mean at least 2000 large cargoes, or 65 big vessels every day. The canal can scarcely be made to do the work.

The directors of the Santo Domingo Railroad now see their way clear to build a road 20 miles into the interior, to tap a mountain of salt almost chemically pure, besides which there are valuable woods.

The imports of ivory into London, the great market for that commodity, last year amounted to 11,757 hundred-weight, which means that at least 30,000 elephants had been destroyed, but merchants familiar with the trade in Africa, whence the chief supplies are derived, think the prospects for the extinction of the great pachyderm very remote. At the last series of sales held in London only 75 tons were offered, but the quantities usually range from 100 to 120 tons. The last auctions in Liverpool disposed of 13 tons, and about 31 tons were offered at Antwerp, which country is now trying to cut into the trade as an outcome of the Belgian efforts in the Congo Free State. One authority reckons the annual mortality of African elephants as high as 65,000 for export alone.

In the States of Central America there is so much of local rivalry and conflict of interests that the scheme for a union of the five republics is not promising.

Sulphite fiber is coming into notice as a substance applicable to a great variety of purposes. Its manufacture originated in Germany. At the present time the English have mills in Norway, also in England, importing the wood for treatment. A strong company, among whom are W. C Whitney, Pierrepont Morgan and Daniel S. Lamont, have the exclusive right to manufacture in the United States, and five mills are in course of erection or already completed. One in Maine has a capacity of 50 tons a day. Under-ground piping is now made from this fiber quite largely in this country, and it may be stated that all the water-piping of the city of Vienna is of this material; doors, ceilings, carwheels, barrels, buckets, trunks and fancy goods are made from it, and its uses are multiplying. Sulphite fiber is a substitute in all grades of paper for other fibrous material. It is made by a chemical process which dissolves all other elements of the wood except the fiber, which it preserves in all its strength.

MANUFACTURING.

Iron and Steel.

The Pittsburgh Steel Casting Company, of Pittsburgh, are about to make an extensive addition to their plant. Work will begin at once on a Bessemer steel plant in connection with their foundry, so that they can make Bessemer-steel castings up to 16,000 pounds in weight. An 8-ton converter will be erected, and the new plant will probably be in operation early in April. The increased activity in the iron and steel business and the large demand for heavy castings have made the addition absolutely necessary, as the company now have all the work on hand which they can handle with their present capacity. One of the principal products of the new department will be heavy steel rolls.

The Chicago Foundry Company, Redfield and Stein streets, Chicago, have for some time been making the manufacture of rolls for rolling-mills a conspicuous part of their business. They have built up a most excellent trade, which has, however, hitherto been largely of a local character. Possessing all the necessary appliances, together with the experience essential for the successful prosecution of such work, they are now desirous of extending their business over a wider area, and are ready to make bids on anything needed in the line referred to.

The East Chicago Foundry Company, whose office is in the Rookery Building, Chicago, and whose works are at East Chicago, Ind., have their new plant in operation, having taken contracts for castings which will require considerable time to fill.

The capital of the Condit-Fuller Company, of Cleveland, Ohio, was not, as we stated in a recent issue, $10,000, but $150,000.

William Wharton, Jr., of Philadelphia, is the president of the Columbia Mining Company, who propose to develop mines and build a blast-furnace at King's Mountain, N. C.

The Southern Iron, Coal and Railroad Company, the incorporators of which are Messrs. Luther C. Watkins, William L. Colcord, Charles E. Wellard, Charles Grant, Jr., and Preston R. Mansfield, Boston capitalists, have just been organized at Nashville, Tenn., and a charter applied for. It is their intention to invest largely in mineral lands in the Eastern portion of the State and build several railroads to aid in the development of their property.

The Straight Fiber Iron Company, whose works were completely destroyed by fire about a year ago, have just rebuilt them, iron buildings having been substituted for those of wood and the works having been much enlarged. The company have been reorganized with J. McGregor Adams, president; Walter L. Lee, vice-president and manager; D. P. Donelson, treasurer; F. Newell, secretary, and M. C. Williams, superintendent. Their specialties are high grades of bar-iron and straight-fiber car-axles, the capacity being 100 tons of bar-iron per day. The works are located on Fortieth street and Stewart avenue, while the offices are in the Rookery Building, Chicago.

At Pittsburgh, on the 13th inst., Adrian H. Jones, of New York City, filed a bill of foreclosure on the part of the Central Trust Company against the Cameron Iron and Coal Company, of Emporium, Pa., and asked that a receiver be appointed. By agreement of counsel Edward P. Parrott, of New York, was appointed receiver. In the bill it is alleged that the foreclosure is in default of the payment of $90,000 interest on $1,000,000 worth of bonds issued. In security for the bonds mortgages were given on lands in Cameron County. No interest, as agreed, was paid and the foreclosure was made.

Riter & Conley, of Pittsburgh, builders of rolling-mills, blast-furnaces, steel-works, &c., have purchased the old Superior Rail-Mill property in Allegheny City for $75,000, the firm to take possession on January 1. Employment will be given to some 200 men and structural iron will be manufactured. The business of this firm has been rapidly increasing for some time, and in order to meet the demands made on them they have been compelled to enlarge their facilities for the production of their manufactures. About a year ago they purchased the plant of D. W. C. Carroll & Co., Limited, boiler manufacturers, at Pittsburgh. The Superior Rail-Mill property which they have just purchased has exceptional facilities for manufacturing purposes, having switch connections with the Pittsburgh, Fort Wayne and Chicago Railway, the Cleveland and Pittsburgh Railroad and the Pittsburgh and Western Railroad. It also has a frontage on the Ohio River.

Cartwright, McCurdy & Co., iron manufacturers, of Youngstown, Ohio, have commenced the erection of a building, 50 x 100, at their plant, to contain an 8-inch mill. It will be completed about February 1 and will give employment to 25 additional hands.

A sale of the personal effects of Long & Co., proprietors of the Vulcan Forge and Iron Works, at Pittsburgh, took place on the 12th inst. The attendance was large and the prices obtained were considered to be about as high as the prices ruling in the market. The first lot of pig, all ore, was knocked down to A. M. Byers & Co. at $17 55—about 200 tons. Scott & McLean took 1500 tons of cinder, Girard, Isabella and Soho. J. H. Clemens took some Republic ore at $6.50 and J. W. Friend a lot at $7, loaded on cars. Mr. Friend, who was buying for the Clinton Iron and Steel Company, went for muck-iron by bidding $30 first jump for it, and then Byers & Co. got some at the same price. Mr. Friend got 40 tons faggots at $27.80. J. B. Jones & Bro. got 20 tons horseshoes, old, at $21.50 per ton. Mr. Friend took a lot of silica fire-brick at $15 and a lot of common at various prices, the whole being considered cheap. Klein, Logan & Co. took a pile of pick-iron at 1 7/8 cents.

In one week recently Phœnix Furnace, of Brown, Bonnell & Co., Youngstown, Ohio, produced 910 tons of No. 1 Foundry Iron. This is a remarkable record when it is stated that this furnace is only 60 feet high, with 14-foot bosh and 8-foot hearth.

Several reports have been published recently to the effect that the Carrie Furnace Company, of Pittsburgh, whose furnaces are situated at Rankin Station, Pa., were about to erect a large steel plant adjacent to their furnaces. We are advised that there is no truth in the report whatever.

Some months ago the Belfont Iron Works Company and the Kelly Nail and Iron Company, of Ironton, Ohio, decided to erect a steel plant at that place for the purpose of supplying steel for their nail factories. The Norton Iron Works, at Ashland, Ky., also became interested in the enterprise, and the three firms decided to combine their interests and erect a plant together. The Belfont and Kelly concerns wanted the plant erected at Ironton, while the Norton interest wished to have it erected at Ashland. Thus the matter has stood for some months, and now it is announced that the two concerns at Ironton have agreed to erect the plant at that place independent of the Norton concern. The citizens of Ironton have subscribed $20,000, which has been turned over to B. H. Burr, secretary and treasurer of the Belfont Iron Works Company. This gentleman states that work will be commenced on the plant as soon as the necessary plans have been prepared.

We are advised that the report that the nail-plate unloaders in the employ of the Laughlin Nail Company, of Wheeling, W. Va., were on a strike is without foundation. The firm have had no trouble with their workmen for some months. Their nail factory, containing 192 nail machines, is in full operation and will turn out more nails during the last six months of 1889 than ever before in a similar period in their history.

D. R. Lean has received a contract for the erection of two 15-ton open-hearth steel-melting furnaces for the W. Dewees Wood Company, of McKeesport, Pa. The furnaces will be of the Lash type. Work on their construction has already been commenced. The Morgan Engineering Company, of Alliance, Ohio, have the contract for the necessary machinery, while W. B. Scaife & Sons, of Pittsburgh, will erect the buildings. D. R. Lean has also received the appointment of consulting-engineer for the W. Dewees Wood Company.

At Detroit, Mich., on the 10th inst., a suit was instituted in the Wayne Circuit Court for damages in a large amount. The plaintiffs are Cofrode & Saylor, consisting of James H. Cofrode and Francis H. Saylor, proprietors of the Philadelphia Bridge and Iron Works, at Pottstown, Pa., and the defendants are Brown, Howard & Co., of New York City, railway contractors. The defendants entered into a contract for the construction of the Duluth, South Shore and Pacific Railroad, in the Northern Peninsula. The plaintiffs, Cofrode & Saylor, were sub-contractors for building the road, and the suit is brought to recover a balance which they claim to be due them from the New York contractors. The actual amount of money involved is not far from $800,000.

The Ætna Iron and Steel Company, of Bridgeport, Ohio, manufacturers of sheet-iron and sheet-steel, recently made a large shipment of iron to British Columbia. The plant of the company is being operated to its full capacity.

The Edgar Thomson Steel Works of Carnegie Bros. & Co., Limited, at Braddock, Pa., will close down during the present week for repairs. During the shut-down another 10-ton converter will be added to the plant and other additions and repairs will be made. The two blast-furnaces now being erected by the above firm are rapidly approaching completion, and it is expected that they will be ready for blast about July 1, 1890.

Machinery.

The Enterprise Boiler Company, of Youngstown, Ohio, have just completed a large order of boilers for the Stewart Iron Company, Limited, of Sharon, Pa.

The Union Switch and Signal Company, of Pittsburgh, have made a 92-lever machine for the Grand Central Depot, New York City, and are at work upon the largest electro-pneumatic signaling and interlocking table yet constructed, for the Union Depot at Kansas City, Mo.

The business of the Westinghouse Electric Mfg. Company, of Pittsburgh, is growing larger every year. During the latter part of 1886, when the company were organized, machinery sufficient to supply 2400 lamps was disposed of; in 1887, 119,950; in 1888, 106,200, and during the first 11 months of the present year, 223,600. The business of the present year will be more than double

that of last year, and will amount to more than all of the previous years combined. The foreign trade recently established is building up rapidly, and their business of next year promises to be enormous.

The King Locomotive and Car Works is the name of a new concern at Bordentown, N. J., who have a capital stock of $1,000,000. John Hedding, who was recently superintendent at the Rogers Locomotive Works, in Paterson, and for a long time master mechanic of the New Jersey Railroad and Transportation Company, will have charge of the works.

We are advised that the report that the Oliver & Roberts Wire Company, Limited, of Pittsburgh, who recently purchased the plant of the Hainsworth Steel Company, in that city, had decided to take the engines out of the plant that were built by the Robinson-Rea Mfg. Company, of Pittsburgh, is without foundation. The last-named firm have received a contract to rebuild the engines and put them in first-class order.

The Westinghouse Air-Brake Company, of Pittsburgh, have declared their regular quarterly dividend of 4 per cent. and an extra dividend of 2 per cent., payable on January 1, 1890. The net earnings of the company for the year ending September 1, 1889, were $1,375,000, out of which $800,000 was paid, leaving a surplus of over $500,000.

The board of directors of the Westinghouse Machine Company, of Pittsburgh, have declared a dividend of 5 per cent. out of the earnings of the last six months. The business of the company is reported to be in a more prosperous condition than ever before in their history.

W. P. Norton, Bristol, Conn., manufacturer of machinists' drills, is erecting a new shop which will be occupied by him in a few weeks.

The Cooper Pneumatic Motor Company have been incorporated at Minneapolis, Minn., for the manufacture of a new motor invented by William Cooper and George P. Hampton, which they claim will revolutionize street railway traffic. Expert engineers are said to have examined its practical workings and to indorse the claims made by the inventors. One of the motors is to be publicly tested in January on one of the Minneapolis street railways.

The Ferracute Machine Company, of Bridgeton, N. J., in addition to their regular line of presses and dies, are making a specialty of outfits for producing various articles in heavy sheet-steel which were formerly cast or forged. They are just fitting up a large carriage factory in the West with all the machinery necessary for producing the axles, "reaches" and other parts of the running-gears of carriages which were formerly made of wood. These form a very neat, light running-gear at considerable less cost than the old style of carriage. The same concern have just turned out a large machine weighing about 25,000 pounds for bending bar-iron up into large links for conveyor chains. The machine produces ten of these links complete per minute. They are also just shipping a special automatic machine for making cleats for fastening electric wires, which are made of Kartavert, a new non-conductor which takes the place of the old-fashioned wooden cleat.

The Cushman Chuck Company, of Hartford, Conn., have just issued a catalogue describing and illustrating the many styles of chucks made by them. Many new sizes have been added, including a new line of independent four-jaw chucks, running from 4½-inch to 28-inch, inclusive; also a new line of impoved lathe-chucks. The line of amateur geared now consists of a 2-inch and 2½-inch, and the amateur's lever is complete with a 2-inch, 3-inch, 4-inch and 5-inch. These are of new design. There are also two new sizes for key drill-chuck and a line of separate jaws for large face-places, which are superior to a chuck for heavy work. The company carry in stock a line of special chucks for cutting-off machines, both for front end and back end. These are for 2-inch, 2½-inch, 3-inch, 4-inch and 5-inch machines.

The new catalogue of the Ingersoll-Sergeant Rock Drill Company, New York, is a large and handsomely gotten up book, describing the many forms of rock-drills made by the company, and also their air-compressors, steam-pumps, engines, boilers, horse and steam power hoisting-machines, derricks, stone-working machinery and the large number of fittings and small tools belonging with these machines. The final pages of the catalogue are devoted to testimonials.

Hardware.

A stock company, with a capital stock of $50,000, have purchased the plant of the Dexter Spring Company, at Hulton, Pa., owned by W. W. Green, and will take possession of same on January 1 next. Articles of incorporation have been prepared and a charter applied for. The incorporators are Theodore Doerflinger, Jesse S. Foster, George B. Knox, Florence C. Miller, C. C. Lee, Harry McCoy, J. W. Fleming, George P. Letsche and Joseph J. Marshall. The new concern will continue to manufacture the Dexter buggy-spring as a specialty, and may add side lines in the future. At present the concern employ some 50 hands.

The Hunter & Comstock Arms Company, Fulton, N. Y., have a factory in Fulton, which is 220 feet long, 50 feet wide and four stories high, the power being furnished by two immense water-wheels, giving them more power than would be required to run their building full of machinery. They intended to manufacture the Harry Comstock hammer and hammerless gun until recently, when they purchased the entire plant of L. C. Smith, of Syracuse, N. Y., who is well known as the manufacturer of the L. C. Smith gun. This plant will be taken to Fulton immediately and will be set up in their factory. In a very short time they hope to be able to turn out guns.

Miscellaneous.

Last week a charter was filed at Pittsburgh for the Pittsburgh Metallurgical Company. The corporation is formed for the manufacture and sale of specimens for metallurgical operations. The capital stock is $10,000, divided into 100 shares of $100 each. The directors are H. H. Byram, John A. Wilson, J. G. Siebeneck, A. J. Lennox and W. C. Magee.

The Fuel Gas Improvement Company, of Pittsburgh, have applied for a charter. The incorporators are George Westinghouse, Jr., Lemuel Bannister, John Caldwell, Charles Paine and H. H. Westinghouse.

Among recently authorized corporations in Illinois are the following: Duplex Rotary Engine Company, at Chicago, for the manufacture of rotary engines; capital stock, $300,000; incorporators, Frederick Meyer, Joseph S. Kiehl, Alexander Grant. American Car Seat Company, at Chicago, to manufacture car-seats and other light car appliances; capital stock, $200,000; incorporators, M. G. Hubbard, W. S. Burling and M. G. Hubbard, Jr. J. S. Hulse Hardware Company of Illinois; location, Rockford, to conduct a general wholesale and retail hardware business; capital stock, $20,000; incorporators, Joshua S. Hulse, William T. Huffman and Guy P. Cobb. Storm Mfg. Company, at Chicago, to manufacture and deal in the MacKenzie hinge-mortiser and other tools; capital stock, $25,000; incorporators, Albert W. Storm, John J. Comstock and Frank F. Reed.

The Speculation in English Pig-Iron Warrants.

Never previously in the history of the Scotch pig-iron ring, says the conservative London *Economist*, have such scenes been witnessed as have this week been enacted. Daily business has been conducted in a high pich of excitement, and for two or three days the uproar and language interchanged at the close of the market have been nothing short of dishonoring to the general body. Last Friday, it will be remembered, it was anticipated that the party who had committed themselves to the oversold side of the account would be unable to meet their bargains, and that the "corner" which had been developing would be made effective. But as it transpired, that calculation was misjudged, by what means it might be indiscreet to describe. Suffice it that all sorts of serious allegations have been openly made and charges of irregularities are scattered broadcast. Both parties to the struggle are financially powerful, but the "bears" have local influences in their favor, while the "bulls" are under the disadvantage of operating from London. The former influences have certainly prevailed so far this week, and so successfully that the "bulls" have been put to the greatest straits in order to obtain the most ordinary finance accommodation. On Thursday matters in that respect came to a head, when an effort to finance some 6000 tons of warrants on a large margin proved unsuccessful; and the threat now is that the whole business will be transferred to London, where money, it is believed, will be readily forthcoming. Whether that step will really be taken remains to be seen, but the mere suggestion has created consternation among the members of the "ring," who reflect that if the bulk of the Cleveland warrants are once taken South they may never come back, as the whole business of dealing in them may be transferred to the London Metal Exchange, the members of which have lately been moving in the direction of introducing pig-iron warrants into their proceedings. There is no doubt that the operators for the rise have the opportunity, if they have the financial power, of doing what is retered to. Already they must have in their control within a few thousand tons of the entire stock of Cleveland iron, and a little more money should secure the balance. This week there has been no business to speak of doing in Cleveland iron warrants; people are afraid to touch them, and the rises and falls have simply been the reflection of the spasmodic tactics of the representatives of the opposing parties. Scotch iron has been artificially depressed, in the hope of sympathetically affecting Cleveland. How the struggle will end no one can foresee. A week or two at the outside should settle the matter one way or the other, as a large quantity of warrants fall due between now and the 19th, and their adjustment will decide the issue. Speculation this week has met with a distinct check; brokers are not doing a modicum of the business of some weeks since, and even legitimate trade is feeling the consequences in lessened orders from the disorganization that exists. Since the month came in the shipments of iron from Middlesborough have fallen away seriously, but that is due largely to the strenuous efforts that are being made to secure all available iron for storage purposes, so as to create warrants.

The Iron Age

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DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Western Outlook for Foundry Pig-Iron.

Western consumers of foundry pig-iron have good reason to feel some anxiety over the prospects for the coming year. The heavy demand for pig-iron from steel manufacturers, which has been a conspicuous feature in the trade of the past six months, projects its influence far ahead into the future. Not only have all the regular sources for the production of Bessemer pig-iron been completely covered for months to come, but inroads have also been made on the furnace capacity, which naturally seems to be attached to foundry interests. It is no uncommon circumstance now to hear of a furnace company who had for years made a specialty of foundry pig-iron taking a large contract for Bessemer and abandoning their foundry trade for the time being. Even some of the best-known foundry brands, which have come to be considered standards by foundry men and almost indispensable in certain mixtures, have yielded to the influences of the time and will be out of the reach of consumers until the demands of the steel manufacturers are sated. The strong inducement to divert the product of a furnace from foundry to Bessemer iron is, of course, the disparity in price, but the desirability of the orders now being placed by the steel manufacturers also has its influence. If $2 to $4 per ton more profit can be made in the production of Bessemer than in making foundry iron it is an inducement of the strongest kind to a furnace man. But when he also sees an order for perhaps 10,000 to 20,000 tons tendered by a single steel concern of undoubted financial strength he can hardly hesitate to cut loose from the foundry trade, with its numerous small sales, involving many separate accounts, with annoyance over shipments and other petty vexations so well known to both maker and consumer. Time was when the difficulty in getting low-phosphorous ores had a deterring influence on foundry men with longings for a share of the good, round orders being placed by steel manufacturers, but in the West that time has passed, and the supply of such ores grows larger instead of smaller from year to year.

The consumers of ordinary foundry pig-iron are not the only ones who have need to carefully study the existing situation, but also those who require a special quality of iron, such as Lake Superior charcoal and strong softeners. A considerable percentage of Lake Superior charcoal has already been placed under contract to be used for Bessemer purposes next year, which will have quite an effect on a branch of the iron trade not at present capable of any rapid expansion. At the same time, the requirements of car-wheel manufacturers and malleable-iron works are likely to be greater next year than they have been this year, by reason of the increased activity among car-builders and manufacturers of agricultural implements. Some of the largest producers of strong softeners in Ohio are known to have taken heavy contracts for Bessemer iron for delivery next year, thus reducing very considerably the quantity of iron of their usual make to meet the necessities of foundry men who will have an increased demand for their products on account of the excellent condition of general trade.

Unless something now wholly unforeseen occurs to interfere with the plainly-marked course of trade and prices, the wide gap existing between Bessemer and foundry pig-iron will only be narrowed by an advance in the price of the latter. It is possible that Bessemer pig-iron may go still higher as the coming year develops a continued strong demand for steel products. In that event foundry iron will have to follow. The limit of the price of foundry iron will be reached when the requirements of consumers are satisfied and not before. No relief is to be expected from the South, as the furnace companies of that section are apparently more keenly alive to the possibilities of the future than their Northern compeers and are asking higher rates now than the latter at common points of consumption. While high prices are undesirable for a great variety of reasons, it must be admitted that at present writing the strongest influences are bearing in that direction.

Labor Plots and Counterplots.

The American Federation of Labor at their session in Boston last week unanimously proclaimed in favor of asserting their demand that eight hours shall constitute a day's work. This measure is said to have been the chief object for which the convention assembled. The principal idea is to get more pay for a shorter day's work, and the 1st of May ensuing is adjudged to be the auspicious time at which to make the concerted movement to this end. The report of the committee as approved represents that while existing conditions do not justify the hope that all the crafts are prepared successfully to enforce the eight-hour system at the time specified, thus inaugurating "the greatest of industrial reforms," many of the trades are ready and more are preparing to make common cause in a strike which it is affirmed will be of huge proportions and paralyze the industries of the country if the demands are not sooner conceded.

This concerted movement for the so-called "emancipation of labor" is liable to encounter several obstacles. One of the most obvious and threatening is the apparent impossibility of harmonious action in any course prescribed. At the very outset important divisions of organized labor find themselves in direct antagonism, and it is an accepted maxim that "a house divided against itself" is never formidable either for attack or defense. The explanation is volunteered that every department of labor is represented by the delegates who have undertaken to regulate the industrial interests of the United States and now profess to see the opportunity they have long been waiting for. The scope of the great strike is contained in the following:

We therefore recommend that the Executive Council shall have power to select such trade or trades from those affiliated with the American Federation of Labor as shall, in their judgment, be best prepared to achieve success, and that each union in the federation be requested to assess their members 10 cents per week for as many weeks as shall be necessary to secure the short-hour day, payment upon such assessment to commence not later than March 1, 1890. That all trades affiliated with the American Federation of Labor not now working the eight-hour day, or between whom and their employers existing contracts may prevent, shall appoint committees to confer with their employers and if possible secure a reduction of the hours of labor to eight per day, and that the Executive Council shall appropriate for their use, if needed, such sum or sums as can be spared from the money received for the trade or trades selected by the Executive Council.

The Federation of Labor, of which Samuel Gompers is president, initiates the movement for emancipation by declaring war with the Knights of Labor, locking horns, so to speak, by adopting a resolution declaring that no conferences would be held with Powderly's organization any longer; that the cards of the Knights of Labor will no longer be recognized by trades unionists. With the leaders at war, what can be expected of the rank and file? And what prospects are there of entering upon a campaign successfully under such auspices?

Basic-Steel Manufacture in the South.

Southern iron-makers appear to have thrown themselves with much vigor and considerable hopefulness into the plan of utilizing the basic open-hearth as the best means of establishing a steel industry from native raw materials. It will be very interesting to follow the lines which the developments in that section of the country will take. On the Continent, and notably in Germany, the basic open-hearth furnace has become to a very large extent a necessary adjunct to Bessemer steel plants, and particularly those largely using the basic Bessemer process. The reason is obvious. The latter, depending as it does upon low-silicon iron, and usually forced, since the growing scarcity of phosphorous materials, to work close on the latter element, is not able to take care of its scrap and that of the rolling-mill. The result is that open-hearth furnaces have multiplied, many of them having been built by outside concerns, until the demand for scrap has become very large and urgent. In other words, the Continental basic open-hearth industry is almost exclusively based upon the pig and scrap method. These conditions do not prevail in the South, so that manufacturers there will be forced either to fall back on the miscellaneous scrap which they can pick up in the open market or adopt the pig and ore method. The latter, in its greatest development in Europe, is being worked at the Brymbo Steel Works, in England. While it is not an essential element of success, it is certainly very desirable to use rich ores, in order to reduce the quantity of slag, with its corroding effects upon the lining. Another point arises with the Southern manufacturers—that is, the form in which the product is to be marketed. The basic open-hearth is particularly well adapted to the production of the mildest steel—in fact, the softest stock yet produced in Europe is made in it. In one of the German works last summer we were gleefully told by the manager that one particular furnace in his plant was running on Swedish

iron. He explained that natural curiosity in tracing up the use to which some of his product was being put developed the fact that the merchant who was the purchaser of that particular grade pasted on each bar before it left his warehouse a label duly setting forth that the material was Swedish iron. While we do not desire to indicate this as a good example for imitation by our Southern manufacturers, it may serve to indicate the character of the product of the basic open-hearth furnace. Now, thus far the market for soft steel in the South seems limited, as the industries employing it as a raw material are not yet established there to any extent, like the manufacture of fine plates, sheets, fine wire, &c. The market for the final product does, of course, exist, so that if once the basic steel process is successfully introduced the allied industries will soon follow. It is in this that the chief significance of the new movement lies.

Our Imports of Iron and Steel.

The difference in the prices of iron and steel in Europe and in this country is beginning to tell on imports. Probably the majority of those in the trade who are not familiar with the manner in which the importing business is carried on may express some surprise and possibly some disappointment because the falling off is not more rapid. The following are the figures:

Imports of Iron and Steel.

Articles.	Oct., 1889.	Oct., 1888.	Ten mos., 1889.	Ten mos., 1888.
Iron ore, gross tons	99,709	40,490	716,809	516,623
Pig-iron, gross tons	12,253	17,903	123,853	167,542
Scrap - iron, gross tons	1,509	5,494	28,300	41,480
Scrap - steel, gross tons	..	553	1,594	8,719
Bar-iron, net tons	2,848	4,285	26,303	29,235
Steel rails, gross tons	17	2,799	6,185	58,473
Cotton-ties, net tons	3,079	7,963	22,387	31,250
Steel hoops, bands, strips, sheets and plates, net tons	1,998	2,653	14,051	20,938
Steel ingots, blooms, billets, &c., net tons	4,132	9,704	75,574	98,592
Sheet, plate and tagger iron, net tons	698	753	6,552	6,072
Tin-plates, net tons	33,309	*	330,411	289,340
Wire-rods, net tons	7,197	7,092	69,451	99,042
Wire and wire-rope, net tons	565	471	3,913	2,972
Anvils, axles and forgings, net tons	158	125	1,336	1,173
Iron and steel chains, net tons	85	48	579	776

* Defect in figures in original.

The bulk of the pig-iron now being imported is spiegeleisen and ferromanganese, of which we do not manufacture enough to cover our own requirements. Scrap iron and steel show quite a heavy falling off, nor have any sales been made of late to lead to a notable increase in the near future. In bar-iron, of which the greater part is Swedish material of special grades, particularly for New England, the importations show a decline. The same is true of cotton-ties, steel hoops, sheets and plates. The deliveries of steel billets and slabs and of wire-rods are, so far as the greater part of them is concerned, on old contracts entered into early in the year. So far as we can learn no new contracts of any consequence on common stock for delivery during the winter have been entered into. The importations will therefore fall off to limit prescribed by the requirements at any cost of manufacturers needing special grades of material.

The tin-plate statistics are interesting, because they better than any article show our growing consumption. Since we do not manufacture any tin-plates whatever in this country, the imports indicate clearly the demand in such lines as the canning industry, the tin-ware trade and the roofing business.

Late Developments in Japan.

The Japanese are such a remarkably progressive and intelligent people, often original, yet always practical, that seldom a year passes by without their having hit upon something new, yet commendable. As an example we may cite the substitution of registration in the place of title deeds of land, recently introduced, to explain which would, however, lead us too far. Then there is the invention of a new floating fort for coast defense by the Japanese admiral Akamatsu, adopted by the Minister of War this year. This fort is to be built on a kind of vessel made of steel and 150 feet in length. The armor is to be 12 inches thick, and the bridge will be specially protected with a steel bulwark of 3 inches. It is to have a double screw and engines of 200 horse-power, capable of attaining a speed of three miles an hour. On the first bridge will be placed 12 15-cm. and on the second 8 26-cm. guns. The crew will number 250 men, and each floating fort is estimated to cost $200,000 American gold. As engineers the Japanese are now being extensively employed even in China, where the supply of qualified Chinese is limited. Some of the local governors, who have not been able to get over their dislike of Americans and Europeans, have engaged a considerable number of Japanese engineers, especially for mining and some departments of manufacture. In some cases Japanese have been engaged in China as instructors in applied science, the teaching being in English.

Japan made a new departure this year by the ratification of the Japanese-Mexican treaty, negotiated by Don Matias Romero, the Mexican minister at Washington, and the Japanese minister there. Before this treaty was signed the European and American residents in Japan—like in all Oriental countries—were under the consular jurisdiction of their own nation. The consequence was that they were excluded from all industrial enterprises in Japan, public works, &c. The new treaty with Mexico places Mexicans established in Japan under Japanese jurisdiction, while Japanese settling in Mexico submit likewise to the ordinary laws of the republic. It is a sort of test treaty, since it is not expected that much will be done between Japan and Mexico, and Mexicans can use every dollar at home in the present activity being displayed there. But it will serve as a model for the treaty now being negotiated between the United States and the leading European nations and Japan, and will materially contribute toward pushing to completion the Japanese railroad system, not an easy matter, since the engineering difficulties are on the whole very great. Now that Japan has for a couple of years past extricated itself from financial and monetary embarrassments, the foreign trade in the island group has taken quite a start, as a comparison between that of the last two calendar years will show, the dollars given being silver:

	1888.	1887.
Import	$65,455,234	$44,304,502
Export	65,705,510	52,407,681
Total trade	$131,160,744	$96,712,183

The ports of Kobe and Osaka are rapidly becoming more important than the rest, Kobe in particular. Thus the total foreign trade of Kobe was only $14,459,964 in 1885. Last year it was $42,971,976 ($24,667,906 import and $18,304,070 export).

The American trade with Japan exhibits these figures:

Calendar year.	Import into the United States.	Domestic export to Japan.
1888	$17,652,038	$4,031,218
1887	17,742,288	4,150,777

In silver dollars Japanese trade statistics for 1888 show the foreign commerce to have been as follows with leading maritime nations:

Statistics of Japanese Trade.

Exports to:		Imports from:	
U. S.	$22,618,483	England	$28,693,767
France	13,636,250	China	10,360,134
China	11,426,114	Br. India	7,689,092
England	8,710,012	U. S.	5,648,733
Germany	1,617,564	Germany	5,260,896
		France	4,125,189
Total	$57,008,423	Total	$61,777,611

The $5,648,733 received from this country included $3,207,693 petroleum, the remaining $2,441,040 being made up of provisions, beverages, engines, mechanical instruments and miscellaneous goods. Russia is now competing with us in petroleum, while the remaining European countries ship thither chiefly dry goods, twist, machinery and hardware. Whether the impending conclusion of the treaty of commerce and navigation between this country and Japan will give an impulse to our domestic export to Japan the future will show. We certainly cannot do without Japanese tea, half of all the tea we consume coming from there, nor without Japanese silk, of which we take rapidly increasing amounts, especially in a year—like the present—when the European silk crop is short.

Quite recently a noted writer has undertaken to figure out what enormous sums of money have been robbed from the consumers of iron and steel by manufacturers of iron and steel, who have availed themselves of the opportunities afforded to them by the tariff. It is evident, however, that the American iron-makers are now fast losing what reputation they may be entitled to as business men keenly alive to every chance to fill their pockets. Taking it all around, they have to-day a margin of at least $3.50 before they reach the cost of importing foreign pig-iron. They are therefore generously abstaining from extracting from a docile community something like $14,000,000. The much-abused steel-rail manufacturers have been even less mindful of the interests of their stockholders. Before foreign producers can capture any of their business they can advance prices fully $14 per ton, which in a year's production of 1,450,000 tons would only be $20,300,000. The mills making wire-billets could clap at least $7 on their price without losing an order. They are throwing away many millions of profits. The makers of bars, plates, structural iron, nails and other articles are equally negligent of their opportunities, if there be any truth in the oft-repeated statement that the sum of the foreign price, plus the duty, marks the limit to the rapacity of American manufacturers.

Sufficient time has now elapsed to gauge pretty correctly the effect of Secretary Windom's ruling in the Mexican silver-lead ore case. This circular was issued on July

17, 1889. We now possess the statistics of imports for three months, showing how much lead was admitted free of duty in August, September and October. The figures are as follows:

Free Lead Imports in Mexican Ores—Pounds of Lead.

Ports.	August.	September.	October.
Corpus Christi, Texas.....	240,990	134,516	27,196
New York, N. Y.	3,443	169	539
Paso del Norte...	1,523,414	2,536,915	2,499,889
Saluria, Texas...	513,495	137,460	516,608
Totals.....	2,281,342	2,809,060	3,044,232

During the month of July the imports had been 5,533,780 pounds, the appraisement beginning on the 22d, and in 1888, when the trade was gradually reaching its great development, it amounted to 55,564,550 pounds. Before the ruling the importations were going on at the rate of fully 3000 tons a month. After its announcement it dropped, as will be seen from the figures quoted, to about 1500 tons a month as a maximum thus far.

These figures furnish conclusive proof that before the ruling in question a large quantity of lead ore was admitted as silver ore.

OBITUARY.

FRANKLIN B. GOWEN.

Franklin B. Gowen, formerly president of the Philadelphia and Reading Railroad and long influential in the anthracite-coal trade, committed suicide at Wormley's Hotel, in Washington City, on Saturday afternoon. The tragedy is believed to have been the result of hereditary insanity. Beyond this it is said that he was much affected by the obvious failure of his case against the railroads and the Standard Oil Company, in which he appeared as the legal representative of George Rice and others.

Franklin Benjamin Gowen was born at Mount Airy, now a part of Philadelphia, on February 9, 1836. His father was James Gowen, who came to America in 1811. Before reaching his majority he began to earn his living as a clerk in a store at Lancaster, Pa., and when scarcely 21 years old he had charge of a furnace at Shamokin, Pa. He left the latter place in 1857, and in 1858 he engaged in the coal-mining business at Mount Laffer, Pa. It was while thus engaged as a member of the firm of Turner & Gowen that Mr. Gowen acquainted himself with the vast mineral wealth of Schuylkill County and its relations to the Reading Railroad Company. His firm failed in business and Mr. Gowen assumed the indebtedness of the firm, which he discharged in later years. Then he turned his attention to the law. Mr. Gowen was elected president of the Philadelphia and Reading Railroad Company in 1869, and for 12 years he carried the stockholders and bondholders with him in his plans for making the road one of the best properties in the country. His faith in the future of the anthracite-coal fields and the Reading Railroad were unbounded, and under his presidency the railroad bought enormously of coal lands. The result was that the company became overburdened with debt. The original line of the road, from Philadelphia to Reading, was 99 miles. Under Mr. Smith and Mr. Gowen the road purchased 229 miles of road, leased 453 miles and secured control of 66 miles. The chief business of the company is the transportation of coal from the first and second anthracite-coal fields of Pennsylvania to tidewater at Port Richmond, Philadelphia.

EDWARD N. DICKERSON.

Edward N. Dickerson, the famous patent lawyer, died at his country home, in Wave Crest, Long Island, 12th inst., aged 65 years. He and Roscoe Conkling were both prominent in the great nickel-plating suits. Mr. Dickerson traveled in Central and South America, gaining knowledge wherever he went. On returning home he devoted himself to scientific studies, which soon developed into invention. Many valuable improvements in steam were the result. The engines of the steamers Bristol, Providence and Rhode Island were built under his patent, which is also in use in China.

HENRY S. CRAVEN.

Civil Engineer Henry S. Craven, of the navy, died at the Naval Hospital in Brooklyn last week. His death was due to heart failure.

Providence Notes.

PROVIDENCE, December 9, 1889.

The Providence Steam Engine Company have just shipped the first of a pair of 1000-horse-power engines for the West Chicago Street Railway Company. These engines, which are of the regular Greene pattern, are the largest of the kind that these works have ever built. They have cylinders 36 inches in diameter by 72-inch stroke, and have each a balance fly-wheel 20 feet in diameter and weighing 37½ tons. They will be run at about 65 revolutions per minute, giving a piston-speed of 800 feet. The cylinders weigh 10 tons, the bed over 10 tons, the shaft and crank about 11 tons, the pillow-block 7 tons and the connections aggregate about 20 tons. The total weight of each engine is about 238,000 pounds. They will be set side by side, but act upon an independent shaft. Power will be transmitted to the winding sheaves by means of gears, and the main shaft of the two cable-driving plants is so connected by clutches that either engine may be used for either section of the cable. The Providence Engine Company's works are enjoying a very prosperous season, having delivered more engines during the month of November than ever before in the same length of time. About $30,000 worth of new tools have been put in and still further extensions are planned. Among the engines lately placed is one of 750 horse-power in the Providence Worsted Mills. This has a stroke of 60 inches and runs at 80 turns per minute almost noiselessly. The Coventry Company have lately had an engine, and a number have been sold to go to various points in the West. The Thomson-Houston Electric Company were so well pleased with the work of the two Greene engines they have had at Lynn, Mass., for four years that when the Thomson Electric Welding Company were organized the power plant was duplicated. Since that time a triplicate of the original order has been filed for the company's carbon-works in Ohio. Among the new tools to be put in will be an 84-inch planer by Bement, Miles & Co., carrying three heads, a smaller planer and a new slotter. The works will then be well equipped with new machines, and have at hand also some very large tools designed and built to handle the heaviest class of work called for by the Government contracts. There are several engines of more than 100 horse-power on the erecting-floor at present. The works have put into service within a month a 30-light Thomson-Houston direct-current dynamo. The engine makes good work of the extra load which, when all the lights are burning, amounts to 15 horse-power. The workshops are well lighted by the arc lamp, while the offices and drafting-room are lighted by incandescents with individual resistance boxes.

Two monster engines are being built at the Rhode Island Locomotive Works for the New York, Providence and Boston Railroad.

The American Screw Company's new gimlet-pointed swage-screw is meeting with large sales in Europe, and a manufactory has been started on Queen Victoria street, London, where the Rhode Island screws are being manufactured directly under the shadow of the Bank of England. William H. Reynolds has taken charge of the manufactory and issued a series of invitations to the large European dealers and consumers to inspect the new process, the machinery for which is all being built in this country. These receptions have been well attended and have resulted in largely increased orders.

The work of crushing and shipping graphite at the Cranston mines by Ewing & Treadwell, in the interest of the Carbon Iron Company, of Pittsburgh, is progressing rapidly, and the work of mining is expected to be resumed again about January 1, as it will require some little time to pump out the water which has collected.

The big chimney of the new works of the Narragansett Electric Lighting Company, on Eddy street, when completed will be 238 feet high and will then be the tallest in Rhode Island. It is said that there is only one taller than this in New England and that one is in Fall River.

The trials of the Howell torpedo, manufactured by the Hotchkiss Ordnance Company, of this city, have been completed before the English Board of Admiralty with much success. Superintendent Elwell is about to arrange for the establishment of a plant at Portsmouth, England, which the encouragement already received from the English authorities warrants. It will be furnished throughout with American tools and machinery. Hotchkiss guns and ammunition received the gold medal at the Paris Exposition, and the firm will make a notable display in the proposed World's Fair of 1892. CLIFFORD.

Ferro-Silicon for Machinery Castings.

The first preliminary report of what appears to have been a most elaborate test of the influence of silicon upon iron castings has been made lately by Herr Juengst, of Gleiwitz, at a meeting of the German Association of Mining Engineers at Halle.

The frequency of breaks, often at a critical period, in iron castings forming parts of mining machinery, and particularly of pumping-engines working under high pressure, led the German manufacturers of mining machinery to a study of the question whether they could not replace cast-iron by a more trustworthy material. Those parts of the machinery in which improvement in material was more particularly desirable were the valve-chests and pump-cylinders. At the present time those parts are manufactured in Germany of cast-iron made from the best grades of gray foundry iron, hematite pig, gray charcoal iron, Scotch No. 1 and choice scrap. Many German manufacturers still adhere to the opinion that it is impossible to get along without the use of Scotch iron. The cast-iron made from such mixtures is required to resist a bending strain of 25 kg. and a tensile strength of at least 14 kg. per sq. mm. Although the factor of safety accepted is generally 12, and under some circumstances as high as 20, in determining the thickness of the castings, fully satisfactory results have not been obtained. The reason probably is that as the thickness of the casting is increased the tendency toward the formation of blow-holes in the castings grows, the grain becomes larger and the iron suffers in strength. Herr Juengst exhibited at the meeting material which possesses extraordinary strength for cast-iron. A number of tests have shown a resistance to bending up to 36.9 kg. and a tensile strength raising to 23.04 kg. per sq. mm.

Gautier's paper on ferro-silicon read at the Paris meeting of the Iron and Steel Institute in October, 1886, led to a series of experiments at the Gleiwitz Works. Different grades of pig-iron were melted in an Ibruegger cupola with additions of ferro-silicon. The material used was analyzed before and after melting in the Royal Laboratory at Berlin and in the laboratory of the Borsig Works, and tests were carried out in the most elaborate way at the mechanical testing laboratory at Charlottenburg, at the Borsig Works and at the Gleiwitz Works.

From a mixture of white pig and ferro-silicon, either of them utterly unfit alone for the manufacture of castings, a gray iron of exceptional quality in every respect was produced, the analysis being 2.24 per cent. of silicon, 0.49 per cent. of combined carbon, 2.22 per cent. graphitic carbon, 0.45 per cent. manganese, 0.93 per cent. phosphorus and 0.13 per cent. sulphur. The bending test showed 36.7 kg., the tensile strength 19.5 kg. and the crushing strength 108 kg. per sq. mm., while the resistance shock was noteworthy. A 30-mm. cube broke only after 11 blows, each representing 130 m. kg. A plate 1 m. square and 20 mm. thick broke only after 24 blows with a 50-pound drop, raised finally to a hight of 5.25 m. It is reported that the shrinkage was low, that the working in machine tools was satisfactory, while the fracture under a glass showed a light-gray net-work in a dark background. Herr Juengst considers this light net-work a steely iron with about 0.5 per cent. combined carbon, while the background consists of deposits of graphite and silicon compounds.

These results led Herr Juengst to use the mixture in the manufacture of large parts of machinery. He first cast a pump cylinder 490 mm. in diameter and weighing 2.1 tons, with good results, the cylinder now being in use at the Gottessegen Colliery in Upper Silesia, working under a water pressure of 190 m. The cylinder of a hydraulic pump of 160 mm. thickness, the casting weighing 4.85 tons, was tight under a water pressure of 280 atmospheres, with the exception of one small spot where some sweating was observed. A valve-chest for the Koenigsgrube weighing 1.4 tons was without a flaw, as were also several steam-cylinders and other larger castings.

The result of the experience stated has been that Herr Juengst has put himself on record as advising that wherever cast-iron is to be subjected to exceptional strains it is better to use white iron with an addition of ferro-silicon than to employ gray iron. We may add that so strong a statement coming from such a source is unusual, since Herr Juengst is regarded in Germany as the foremost authority on foundry practice.

A Chicago Ship-Yard.

The Chicago Shipbuilding Company have selected a site for their new ship-yard. It will be located on the east side of the Calumet River in South Chicago, extending from 100th to 102d streets. It is expected that the dredging, piling and dock-work will be undertaken before the year ends, and that the company will be ready to lay the keel of the first ship by the 1st of next April. The projectors of this new enterprise propose to make the yard one of the finest in the country, with facilities for building six ships at a time. Three ships will be constructed at right angles to the river, each with two building-berths. Machine-shops will be erected in the course of time, and a dry-dock will form part of the plant also.

The practical ship-builders connected with the company are John F. Pankhurst and W. I. Babcock. Mr. Pankhurst is also vice-president and general manager of the Globe Iron Works, of Cleveland, a very prominent steel ship-building establishment. Mr. Babcock was at one time connected with the Roach ship-yard, at Chester, Pa., and was subsequently superintendent of the Union Dry Dock Company, of Buffalo, in which capacity he supervised the building of several of the most famous of the steel steam-ships now on the lakes.

The officers of the company are as follows: John F. Pankhurst, president; Luther Allen, vice-president and treasurer; W. I. Babcock, manager. Directors: M. A. Hanna, H. N. Hanna, John F. Pankhurst and Luther Allen, all of Cleveland, and W. L. Brown, Robert Forsyth and W. I. Babcock, all of Chicago. It will be seen that the company's management is of the highest character, both as to the capitalists interested and the practical experience of the executive officers. Although Chicago has long needed a ship-yard, it was probably well for the best interests of the city that its establishment has been delayed until such reputable hands were willing to undertake the task.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 18, 1889.

The Committee on Ways and Means have had several conferences during the past week preliminary to the commencement of their work of preparation of a bill for tariff revision and revenue reduction. The committee, in order to hasten their work, at their latest meeting decided to hold sessions during the Christmas recess. They expect during this period of adjournment to make considerable headway, as they will be unmolested by the routine duties of the House. The committee have settled the fundamental point of preparing a composite bill to embrace tariff revision, internal revenue reduction and administrative reform. The committee are opposed to taking up these questions in separate bills, for the reason as they state that to do so would involve a long, tedious and profitless discussion on each measure. The same amount of rhetoric, logic and campaign buncombe for one phase of the subject would answer for the three branches taken in lump.

The Republican members of the committee have also been in conference with the Senate Committee on Finance in regard to the features of the Senate bill of last Congress, and are disposed to incorporate many of the provisions of that measure, particularly in the placing of a protective duty on certain unprotected articles, as tin-plate. The committee are planning to have the bill ready by the 1st of February. As a large mass of unutilized testimony is in their hands and also contained in the voluminous printed tariff statements of the Senate, it is not thought that it will be necessary to have any hearings in the wholesale methods of committee preparation, as such a course would only prolong the work and lessen the chances of legislative action at the present session, which is the earnest desire of the committees of both Houses and of the Republican leaders. It is fully realized by them that the protective interests of the country having a majority in the Senate and the House of Representatives, now is the time to place the industries of the country on a solid foundation, as far as legislation is concerned. These same favorable conditions may not exist in the Fifty-second Congress.

The Senate Committee on Naval Affairs, of which Mr. Cameron, of Pennsylvania, is chairman, have taken up the report of the Secretary of the Navy in earnest. They have had Secretary Tracy before them to talk over his recommendations for the construction of eight battleships from 7000 to 10,000 tons and other warlike craft. To-day Ship-builder Chas. Cramp, of Philadelphia, was heard. They propose to get all the light obtainable on the subject from official, expert and practical sources, and will then submit a bill which will embrace an elaborate project for the further construction of steel ships of the maximum tonnage and greatest speed of their class.

PERSONAL.

Ernst Prochaska, of Birmingham, Ala., who was for eight years connected with the basic steel works at Teplitz, Austria, and for two years with the Pottstown Iron Company, leaves for Europe on the 21st inst. It is understood that he makes the trip in the interest of parties who desire to go into the manufacture of basic open-hearth steel, probably in Alabama.

H. T. Ganse, vice-president of the Harlan & Hollingsworth Company, in Wilmington, presided at a meeting to discuss commercial union with Canada.

George L. Oliver, the well-known iron manufacturer, of Pittsburgh, and a member of the Oliver Iron and Steel Company and the Oliver & Roberts Wire Company, Limited, has been requested to apply for the position of Superintendent of Census for the Ninth Pennsylvania District, which comprises Allegheny, Greene, Beaver and Washington counties. Mr. Oliver declines to state as yet whether he will be a candidate for the position.

Edward M. Parrott, of Orange County, N. Y., has been appointed receiver for the Cameron Coal and Iron Company, of Pennsylvania, and it is assumed that the works will be kept in operation.

Irving Scott, president of the Union Iron Works, in San Francisco, is visiting New York.

F. W. Benham, for the past 15 years with the Stanley Works, New Britain, Conn., has accepted the position of secretary and treasurer of the Shelton Company, Birmingham, Conn., succeeding the veteran George Blakeman, who retires after 36 years of active service with the Shelton Company.

J. T. Hill has resigned his position as the secretary and treasurer of the Soddy Coal, Iron and Railway Company, of Chattanooga, Tenn., to accept that of manager of coal mines of Sloss Coal and Iron Company, of Birmingham, Ala., with headquarters at Coalburg, Ala.

An error crept into the article on aluminium by Romaine Cole, of Waterbury, published in last week's issue of *The Iron Age*, for which he was not responsible. In referring to the Cowles process he was made to say: "The greatest step in advance of the Deville process previous to the publishing of the Hall direct method was that of the Cowles electric-furnace process, which consists of smelting the metal direct from corundum, an oxide of aluminium, by means of an electric current coupled with the reduction of some other metal such as copper or iron by solid carbon." The last part of the sentence should read: "Coupled with the reducing action of some other metal and solid carbon."

Watson & Stillman, of this city, call our attention to an error in the description of the machinery of the St. Clair tunnel, which they supplied. In each shield there are twenty-four 250,000-pound pressure-cylinders, and not twelve, as stated.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. }
PHILADELPHIA, Pa., December 17, 1889. }

Pig-Iron.—The market has been a little quiet during the week, but prices are very firm. The amount of business done appears to be small, but, nevertheless, the demand is equal to the supply. As we said last week, most of the large consumers were arranged with some time ago, presumably at prices much below what are now quoted. This explains the apparent indifference of many of the large producers, as well as the absence of such a heavy ourrent demand as the prevailing conditions would seem to render inevitable. In other words, a large proportion of the next quarter's production has already been placed, so that both buyers and sellers are out of the market as regards heavy transactions. There is, of course, the usual day-to-day demand, and this perhaps is somewhat more important than in ordinary times, but buyers do not take kindly to the prices at which Iron is offered to them. Still it goes in a small way at $17.50 @ $18 for Gray Forge, $18.50 @ $19 for No. 2, and $19.50 @ $20 for No. 1, tidewater deliveries. A few choice brands command still higher figures, but these are the usual asking prices for fair to good qualities. The feeling at present is quite firm, but it cannot be said that prices are thoroughly settled. There is no pressure to realize, however, and the chances are reasonably safe that these figures will be maintained. A period of dullness is pretty generally expected until after the holidays, but in view of the orders already entered it is not likely that any material change in prices will be made for the present. But it is well understood that the conditions are entirely different to those of former years, and a very slight movement might set the ball rolling again.

Bessemer Iron.—Great interest is felt in regard to the course of the market for this specialty. In fact, it appears to be the key-note of the position, and both here and abroad developments are watched with the closest interest. Much higher prices are talked for Bessemer in Western markets, but in this vicinity the feeling is more conservative Sales by Eastern makers have been recently closed to the extent of probably 60,000 tons at an average price of about $21.50 at furnace, and as additional furnaces are being turned on Bessemer it is hard to see why there should be any great scarcity. It is claimed that the Ore supply will be insufficient, but it is not likely that furnaces would change their product without ample arrangements were completed for their supplies. Again, it is said that large consumers have secured all the Iron they will require for at least six or eight months to come, and that there will be only a very limited market for whatever surplus there may be during the next six months. In other words, while there is every prospect of an enormous consumption, it is believed that the heavy purchases of the past 60 days and the arrangements already made for continuous supplies are sufficient to prevent either inconvenient scarcity or materially higher prices. This, of course, is simply the expression of opinion on one side of the subject; the other side appears to be confident of much higher prices, but as a matter of fact, there is reason to believe that the class of consumers not provided for are comparatively of no great importance. Still, the bull clique are very powerful, and they may carry out their programme, which includes much higher prices for Steel and Steel materials.

Foreign Material.—There is not much doing in either Speigel or Ferromanganese, but holders ask $36.50, c.i.f. duty paid, for the former and $100 for the latter.

Billets.—There is not much new business on the market, as both buyers and sellers appear to have made their arrangements for January and February. Prices, however, are very firm and are usually quoted as follows—say $36 @ $37, delivered, for Nail Slabs and $37.50 @ $38 for Sheet or Tank purposes. Sales have been made during the week at prices as above.

Blooms.—Charcoal, $53 @ $55; Run-out Anthracite, $43 @ $45, and Scrap Blooms, $34 @ $35 ₽ Bloom ton.

Muck-Bars.—The market is very firm and holders generally are asking $31, at mill, and upward. A few lots have been secured, however, at from $30.50 to $31, but at anything over the latter figure buyers are inclined to hold off. The feeling is very strong, nevertheless, and business could not be done to any extent unless on sellers' terms.

Bar-Iron.—The market is a little quiet, although prices are well maintained at 1.95¢ @ 2¢ for carload lots, city delivery, or 1.85¢ @ 1.90¢, f.o.b. cars at country mills. The immediate demand is not large, but there is enough business to go round and prevent anything like scarcity of work or weakness in prices. The general outlook is encouraging, and after the holidays it is expected that the demand will again assume large proportions. At a meeting of the Philadelphia Rolling Mill Association, held here yesterday, it was decided to advance the price to 2¢, which was considered to be a fair average quotation. The demand for Skelp is not as brisk as could be desired, but the high cost of production leads manufacturers to quote somewhat higher prices—say 1.9¢ for Grooved and 2.15¢ for Sheared.

Plates.—The market is a little quiet at present, and while there is a great deal of work on hand and a great deal more in sight, the amount actually placed during the past week or two has not been important. Still, prices are very firm and it would not require much of a demand to cause a further advance. At present quotations are about 2.30¢ @ 2.35¢, delivered, for Ordinary Iron Plates and Tank-Plates; 2.40¢ @ 2.45¢ for Universal Plates ; Shell, 2.6¢ @ 2.7¢ ; Flange, 3.25¢ ; Fire-Box, 3.75¢ @ 4¢ ; Steel Plates, Tank and Ship Plate, 2.50¢ @ 2.60¢ ; Shell, 2.75¢ @ 2.8¢ ; Flange, 3.15¢ @ 3.20¢; Fire-Box, 4¢ @ 4½¢.

Structural Material.—New business is not important, but mills are crowded with work, so that a temporary absence of demand is an advantage, rather than the reverse. There is plenty of business in sight, however, so that prices are very firmly held at about the following quotations: Bridge-Plate, delivered, 2.35¢ @ 2.40¢; Angles, 2.30¢ @ 2.35¢; Tees, 2.7¢ @ 2.8¢; Beams and Channels, Iron and Steel, 3.1¢; Steel Plates and Angles range from 20¢ to 30¢ higher than the same in Iron.

Sheet-Iron.—There is a continued good demand for all the various numbers, and prices are very firm. Inquiries for January and February delivery show that consumption has been heavier than usual, and, as stocks are the lowest for years, it is quite likely that prices will rule higher in the near future. Meanwhile carload lots are quoted as follows :

Best Refined, Nos. 14 to 20	3.10¢
Best Refined, Nos. 21 to 24	3.30¢
Best Refined, Nos. 25 to 26	3.50¢
Best Refined, No. 27	3.60¢
Best Refined No. 28	3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4⅛¢

Best Bloom Sheets, 1-10¢ extra over the above prices.

Best Bloom, Galvanized, discount	62½ %
Common, discount	65 %

Steel-Rails.—The volume of business is not large, but manufacturers are quite satisfied to wait until buyers can pay $35 at mill and upward. There is plenty of work to go on with for the next couple of months and the fullest confidence is felt in regard to prices. Nothing less than $35 would be taken, and a little more is asked for certain deliveries.

Old Rails.—The supply is so small that business is necessarily very much restricted. Prices are firm as quoted a week ago, viz.: $27 @ $27.50, Philadelphia or at interior points. There is a good deal of inquiry and it is believed that large lots would be taken if offered at the figures above named.

Scrap-Iron.—There is a good demand but the offerings are extremely light, so that prices are strong, with an upward tendency. Sales at about the following figures: No. 1, $25 @ $25.50 for carload lots, delivered; or for choice, $26; No. 2 do., $17 @ $18; Turnings, $16 @ $17; Old Steel Rails, $21 @ $23; Cast Scrap, $15.50 @ $16.50; do. Borings, $11 @ $12; Old Fish-Plates, $28 @ $30.

Nails.—There is not much business being done at present, but prices are very firm at from 2.10¢ to 2.20¢ for Iron Nails and 20¢ to 25¢ additional for Steel.

Esherrick, Cotton & Co. announce that on December 16 they will remove their offices to Commercial Union Building, 418 Walnut street, Rooms 53 and 54.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. }
CINCINNATI, December 16, 1889. }

Pig-Iron.—The past week has presented no new features of interest or importance to the local market for Pig-Iron. The demand has been active and in the aggregate sales have been large, but as a rule the individual transactions have been of moderate proportions. The week has been somewhat irregular, some days being very dull and others being very active; to-day some heavy orders were booked, and there were rumors of other large sales in which Cincinnati was deeply interested although not directly involved in the sales. A strong tone has prevailed, but no advance can be recorded; yet at the close there are reports of higher prices than have yet been mentioned here. There is a belief that the sales of Gray Forge at $17.75 are exceptional, the bulk of the transactions being at $17.50. Sales of No. 1 Southern Foundry have generally been at $18.75@ $19.05, and mainly of small or at the most of moderate amounts. At the close, however, 500 tons are reported to have sold at $19.30, cash. This has not been verified. No. 2 Foundry has sold at $18.25 @ $18.50 and No. 3 do. at $17.75 @ $18, cash, for January to March, inclusive, delivery, the largest sale reported being one of 500 tons on this basis, but several thousand tons of Gray Forge have sold in lots of 1000 tons at $17.50, for delivery extending through April. To-day it is learned that speculators have again entered the market, several lots of 3000 and 5000 tons being offered at outside prices quoted, but how far the sales were successful is not mentioned. Twelve thousand tons Lake Superior Iron have been sold on the basis of $23, cash, Cincinnati, to be delivered 1000 tons per month for a year. It is also reported that 12,000 tons No. 3 Foundry and Gray Forge have been sold at Louisville on the basis of $18 and $17.50 respectively, here. Four hundred tons Virginia Iron, Lowmoor, have been sold on the basis of $19.70, four months, Cincinnati. Southern Car-Wheel Iron has been quite

strong, with sales of 1000 tons at $24.50 and 500 tons do. at $25, cash, for three months' delivery. The fact that small buyers are placing orders readily adds to the belief in still higher prices, although apparently there is no lack of Iron. The day closes upon an active, strong and buoyant market. The current prices here at the close, cash, f.o.b., are as follows:

Foundry.

Southern Coke, No. 1	$18.75 @ $19.00
Southern Coke, No. 2	18.25 @ 18.50
Southern Coke, No. 3	17.75 @ 18.00
Ohio Soft Stone Coal, No. 1	18.00 @ 18.50
Ohio Soft Stone Coal, No. 2	17.50 @ 18.00
Mahoning and Shenango Valley	18.00 @ ....
Hanging Rock Charcoal, No. 1	21.00 @ 23.00
Hanging Rock Charcoal, No. 2	20.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1	19.00 @ 19.50
Tennessee and Alabama Charcoal, No. 2	18.00 @ 18.50

Forge.

Gray Forge	17.50 @ ....
Mottled Neutral Coke	16.50 @ 17.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel	24.00 @ 24.50
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	22.75 @ 23.00

Manufactured Iron.—There has continued to be a satisfactory market, with mills and foundries busy and full prices realized for all kinds.

Nails.—The market has remained firm, with a good demand. Iron and Steel Nails, 12d to 40d, sell at $2.35 @ $2.45 ℔ keg, with 10¢ rebate in car lots, at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, $1, and 2d, $1.50 ℔ keg more; Steel Wire Nails sell at $3.10 @ $3.20 for 60d.

Old Material.—There has been a good demand for Old Rails in sections north of the Ohio River, with $27.50 bid and $28 asked on the line of the roads feeding the territory. Sales of Rails on roads south of the Ohio have been made at $26.50 in lots of 300 tons. Old Wheels have been sold at $20, cash basis, Cincinnati.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, December 16, 1889.

Pig-Iron.—The market seems to have become fairly well settled on the basis of prices quoted during the past two or three weeks. Furnace men have sold about all the Iron they care to dispose of for the present, and are looking forward to next year to market their product at higher prices. Whether they will be able to do so is hard to say. On the other hand, consumers are holding off and refuse to place their orders now, justifying their action with the argument that large quantities of Iron will be offered for sale after January 1st and their chance of placing orders at that time at less money will be considerably better than at present. As the case now stands, to an unprejudiced observer, the seller has the advantage, as the large manufacturing concerns are almost wholly without Iron and will be compelled to come into the market early in the year. A firm front presented by the furnace men will force values higher. During the week under review the only sale of any note was a 2000-ton lot of Gray Forge at $17.10, f.o.b. St. Louis. This is a low figure and the buyer has without doubt secured a bargain, but it is doubtful if the purchase could be duplicated. For ordinary sized lots we quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$19.00 @ $19.50
Southern Coke, No. 2 Foundry,	18.50 @ 19.00
Southern Coke, No. 3 Foundry,	18.00 @ 18.50
Gray Forge	17.50 @ 18.00
Ohio Softeners	19.00 @ 19.50
Lake Superior Charcoal	22.00 @ 23.00

Missouri.

Charcoal Foundry, No. 1	18.75 @ 19.25
Charcoal Foundry, No. 2	18.00 @ 18.50

Tennessee.

Charcoal Foundry, No. 1	19.00 @ 19 50
Charcoal Foundry, No. 2	18.00 @ 18.50

Connellsville Coke, f.o.b. East St. Louis, $5.25; St. Louis, $5.40.

Bar-Iron.—Mills report a slight falling off in orders, but as they are well filled with contracts taken some weeks since they are kept busily employed, and have as yet been unable to make any surplus stock. Mills quote 2¢ for round lots, which price, however, is shaded somewhat, according to circumstances. Lots from store are quoted at from 2.10¢ to 2.15¢.

Barb-Wire.—A continuance of the mild weather has enabled mills to market considerably more Wire than they otherwise would have done. Prices are being adhered to and a further advance by the first of the year seems probable. We quote as follows: Painted, from 3.30¢ to 3.35¢; Galvanized, from 3.90¢ to 3.95¢; carload lots, 10¢ ℔ 100 lbs less than above prices.

Louisville.

LOUISVILLE, KY., December 16, 1889.

Pig-Iron.—The market has been very firm during the past week, though no large sales are reported. Advices from other portions of the country indicate that markets not dependent entirely upon Southern furnaces have not been paying the prices asked here, but an advance will probably take place before the first of the year, which will place them upon the same basis that Iron has been selling here. Furnaces are offering freely and for deliveries during six months of next year, and some large sales have been reported elsewhere. That Iron will be strong during the coming season and advance sharply is generally believed, as advices from abroad indicate that the foreign market is in no danger of a sudden collapse, but that they anticipate a good year, which it is believed will greatly strengthen our own market. What sales have been made here have been on the basis of $17 for Gray Forge, $17 for No. 2 Soft and $18 for No. 2 Foundry. Prices remain unchanged.

Cleveland.

CLEVELAND, December 16, 1889.

Iron Ore.—An immense amount of Ore is being sold at about the same prices given in the telegraphic summary sent last week. It is the generally expressed opinion among Ore dealers that 3,000,000 or 3,500,000 tons of Ore for 1890 delivery have been sold and that tonnage has been engaged for the transportation of at least 5,500,000 tons. Nearly all the big mines in the Gogebic range have sold liberal quantities of Bessemer Ore at prices equivalent to $5.75 @ $6.15, f.o.b. vessels Cleveland. Menominee Bessemers are bringing $5.50 @ $6, while $6.25 is paid for the output of a few favorite mines. No. 1 Specular and Magnetic Ores command $6.50 @ $7. The details of actual transactions are not easily obtained, although several sales of Gogebic Bessemer in 10,000 to 20,000 ton lots are known to have taken place at $5.75 @ $6. Red Hematites, Bessemer quality, are commanding $6, f.o.b. vessels lower lake ports. Following are to-day's quotations:

No. 1 Specular and Magnetic Bessemer Ores, Bessemer quality	$6.50 @ $7.00
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	5.00 @ 5.75
Red Hematite Ores, Bessemer quality	.... @ 6.00
Red Hematite Ores, Non-Bessemer quality	4.50 @ 5.00
Menominee Range Ores, Bessemer quality	5.50 @ 6.25
Menominee Range Ores, Non-Bessemer quality	4.25 @ 5.00
Gogebic Range Ores, Bessemer quality	5.25 @ 6.00

Pig-Iron.—Prices seem to be matters of minor consequence in the present demand for Iron. There has been a square advance of $1 ℔ ton in the Bessemer market since the report telegraphed last Wednesday afternoon, and cash transactions at $25 are reported. There is also an improvement in the Lake Superior Charcoal markets, prices having advanced to $21.50 @ $22.50, a result due less to the slightly increasing demand than to the fact that dealers have begun to realize that they were selling their product lower than the prices for other Irons seemed to warrant. There is a good, strong demand for Mill Irons. Following are to-day's cash quotations.

Nos. 1 to 6 Lake Superior Charcoal	$21.00 @ $22.50
No. 1, 2 and 3 Bessemer, ℔ ton	.... @ 25.00
No. 1 Strong Foundry, ℔ ton	19.80 @ 20.80
No. 2 Strong Foundry, ℔ ton	18.80 @ 19.80
No. 1 American Scotch, ℔ ton	18.80 @ 19.80
No. 2 American Scotch, ℔ ton	17.80 @ 18.80
No. 1 Soft Silvery, ℔ ton	18.50 @ 19.50
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	17.80 @ 19.30
Mahoning and Shenango Valley Red Short Mills, ℔ ton	18.50 @ 19.00

Scrap-Iron.—The demand for Old Rails scarcely keeps pace with the increasing quotations, $27.75 @ $28 now being demanded for Old Americans. The inquiry for Old Wheels is also improving.

Detroit.

WILLIAM F. JARVIS & Co., under date of December 16, 1889, say: There has been more inquiry, especially for Bessemer and Lake Superior Charcoal, the past week than any time for the past month. Several large buyers of Lake Superior Charcoal will be obliged to place orders early in January, and only a few months ago they supposed they had enough bought to carry them until the opening of navigation next year. Furnaces are trying to take care of regular customers, but are not seeking any outside orders. With the advanced price of Ore the cost of making Iron will be greater, and the prospects of a still further advance in January are good. With a very firm and fairly active market we quote as follows:

Lake Superior Charcoal, all numbers	$21.00 @ $22.00
Lake Superior Coke Bessemer	24 50 @ 25.50
Lake Superior Coke Foundry, all ore	20.50 @ 21.50
Lake Superior Coke, cinder mixed	19.00 @ 20.00
Standard Ohio Blackband	20.50 @ 21.50
Southern No. 1	19.50 @ 20.50
Southern Gray Forge	17.50 @ 18 00
Southern Silvery	17.00 @ 18.00
Jackson County (Ohio) Silvery	19.25 @ 19.75
Old Car-Wheels	19.75 @ 20.25

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 16, 1889.

Pig-Iron.—The most prominent feature of last week's business was the sale of large quantities of Lake Superior Charcoal Iron for next year's delivery. In most cases $22, cash, was realized, but $22.50 was obtained for some. The bottom price now named by the furnace companies is $23. Local Coke Foundry Iron is selling in small lots only, but prices are being established on a somewhat higher basis, and cash quotations are now $20 @ $21 for No. 1, $19.50 @ $20 for No. 2 and $19 for No. 3. A few Southern furnace companies have reappeared in the market and are making quotations for 1890. The usual price is $20.30 for No. 1, with corresponding rates for lower grades, but some sellers will take orders for the present at $19.75 for No. 1. American Scotch (Blackband) No. 1 continues to be quoted at $20.50 @ $21.50, according to brand, but the supply is very limited; Ohio Silveries No. 1, $19.25 @ $20; Tennessee Charcoal No. 1, $20 @ $21; Alabama Car-Wheel, $25 @ $26.50

Bar-Iron.—Orders for considerable quantities of Car specifications have been

tendered manufacturers at the rates ruling a week or two since and refused. The report sent out from Pittsburgh of a probable advance in card rates has had much to do with stiffening this market. An advance in the card means higher wages, and makers are consequently loth to enter orders except at prices which will cover the increased cost threatened. Ordinary specifications of Common Iron are quotable at present at 1.95¢ @ 2¢, half extras, f.o.b. Chicago, but it would not be surprising if these figures were suddenly advanced. Jobbers are working up to 2.2¢ as their bottom price from stock, and that will probably be the established rate in a very few days.

Plates, Tubes, &c.—Mill business has shown a decided increase and a great deal of work is now coming in sight, which will keep trade good in this line. The higher prices being named do not seem to check orders. Heavy buyers find it difficult to get manufacturers to quote on deliveries for next year. Store prices are as follows: Iron Sheets, Nos. 10 to 14, 2.90¢ @ 3¢; Steel do., 3.10¢ @ 3.25¢; Tank Iron, 2.80¢; Tank Steel, 2.90¢ @ 3¢; Shell Steel, 3.25¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 50 % off for 1¼-inch and less, 52½ % off for 2-inch and 55 % off for over 2-inch.

Sheet-Iron.—Manufacturers' prices are very firm on Galvanized Sheets and their bottom rate on Juniata now is 62½ and 2 % to largest buyers. Jobbers continue to quote at 50 and 10 % off. The movement is still heavy. Black Sheets are quiet in comparison and can be bought at 3.15¢, at mill, for No. 27, while small lots from store command 3.50¢. W. Dewees Wood Company's Refined Sheet-Iron has been advanced $\frac{1}{10}$¢.

Merchant Steel.—This class of material is quiet, but very firm. Base prices for carload lots are as follows, f.o.b. Chicago: Tire, Toe-Calk and Machinery Steel, 2.60¢ @ 2.80¢; Open-Hearth Spring, 2.65¢ @ 2.85¢. The higher rates named are now the minimum quotations of the largest manufacturers. Small lots from store are selling at 2 75¢ @ 3¢ for Machinery, 7.50¢ and upward for Tool and 7¢ @ 10¢ for Sheet

Steel Rails, &c.—The Rail situation is unchanged, $37 @ $36.50 being quoted, while sales are light. Other Track Material is less called for than has been the case for some time, while quotations are as follows: Soft Steel Splice-Bars, 2.25¢; Iron do., 1.95 @ 2¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.80¢ @ 2.90¢; Hexagon do., 2.95¢ @ 3¢.

Old Rails and Wheels.—Old Iron Rails maintain their price of $26.50, with a slightly better supply coming forward. Old Steel Rails are in strong demand, with pieces over 6 feet long worth fully $21.50 @ $22 and shorter lengths $20.50. Frog Rails have been sold at $20.25. Old Car-Wheels are held at $20, with some speculative interest developing.

Scrap.—The supply of Old Material is large and consumers are generally well stocked, yet prices are fairly well maintained. Among other transactions it is reported that some 300 tons of No. 1 Railroad Wrought were sold to a Western mill at $23.50 ℔ net ton, delivered. Chicago dealers' selling prices are as follows, ℔ ton of 2000 lb: No. 1 Forge, $22; No. 1 Mill, $17.50; No. 2 Mill, $12.50; Car Axles, $26; Fish-Plates, $23.75; Horse-shoes, $20.50; Pipes, &c., $15.50; Cast Borings, $9.75; Wrought Turnings, $14; Axle Turnings, $16; Machinery Cast, $14.50; Stove-Plates, $11.50; Coil Steel, $18; Leaf Steel and Tires, $19; Mixed Steel, $15.50 @ $16. Purchasing price of Mixed Country Scrap is $17 @ $17.50.

Hardware.—Jobbers of Shelf Hardware are in some instances being compelled to secure outside help in taking their inventories, the time of their usual force being wholly needed to take care of current business. Advances on numerous lines of goods are impending, and price-lists are likely to be entirely reconstructed by the 1st of January. The Heavy Hardware trade also keeps up wonderfully well for the season and the indications point to an even better kemand after the close of the year. Carriage and Wagon Springs have been marked up 5 %, Seat Springs have advanced 20 % and Axles will shortly follow.

Nails.—Manufacturers having advanced Cut Steel Nails to $2.35 at factory, the price of small lots from store has been made $2.60, with 5¢ off for carloads. Another advance is promised by the manufacturers at an early day, probably at their next meeting, which occurs at Wheeling on January 8, and the trade here will not be surprised if a rate of $2.50 at factory should be established. Wire Nails have been offered the past week at $3, Chicago, by some manufacturers for strictly December shipments, but higher rates are looked for in January. Small lots from stock are sold at $3.15, with 5¢ off for carloads.

Barb-Wire.—Purchases in quantity are being made by those who can spare the money to carry a stock until spring, but there is no general demand at present. Prices are very firmly held at 3.35¢ for small lots of Painted, 3.25¢ for carload lots and 60¢ ℔ 100 lb advance for Galvanized.

Pig-Lead. — Transactions have been limited to carload lots at 3.65¢ @ 3.70¢.

A. C. Haws, Room 411, Phœnix Building, Chicago, will hereafter conduct an independent Pig-Iron commission business. Mr. Haws is well known among consumers of Pig-Iron in the Northwest, having been connected with the Chicago Iron trade for 11 years. He represented Matthew Addy & Co. for eight years and the Tennessee Coal, Iron and Railroad Company for the past three years. Mr. Haws will have a number of Northern and Southern agencies, embracing manufacturers of Lake Superior Charcoal as well as Coke Irons. Having been very successful as an agent, his friends predict a bright career for him as an independent operator.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, December 16, 1889.

Pig-Iron.—We have to note about the same condition of the market; $15.50 @ $16 now appear to be the standard prices at which No. 1 is being held and sold, and if it cannot be bought at one furnace it can at another. Upon the whole the outlook is as satisfactory as the most sanguine could expect.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, December 17, 1889.

There is continued activity in the Iron and Steel trades, the latter in particular. The year just drawing to a close will go into history as one of great activity in the lines in question, and the year 1890 promises to exceed it. Not only are old plants being extended and remodeled and supplied with all the latest appliances and improvements, but plans and specifications are being prepared for new ones.

Pig-Iron.—The activity noted for some weeks past continues, but with less excitement. Prices show a still further advance of 25¢ @ 50¢ ℔ ton, and brokers report that there is not much difficulty in making sales at the advance. The greatest trouble so far as they are concerned, they say, is to get the iron to sell. Never before were the furnaces in this district so fully employed as at the present time. Many of them are well sold up into next year. There is some talk of stock having increased recently in first hands, but if true it is in consequence of the inability of the railroads to move it. We are cognizant of some furnaces having considerable Iron piled up, but it is all sold and will be placed on former contracts as soon as transportation can be secured. It is worthy of mention that Mill Irons have been more active during the week under review than Bessemer, but it is claimed that there is still too much difference between the prices of the two. The demand has been until within the past week more urgent for Bessemer than Mill, and this explains why the former advanced more rapidly than the latter. We now quote prices as follows:

Neutral Gray Forge	$18.00	@ $18.50,	cash
All Ore Mill	19.00	@ 19.50,	"
White and Mottled	17.00	@ 17.50,	"
No. 1 Foundry	18.50	@ 19.00,	"
No. 2 Foundry	18.00	@ 18.50,	"
No. 1 Charcoal Foundry	24.00	@ 25.00,	"
No. 2 Charcoal Foundry	22.00	@ 23.00,	"
Cold Blast Charcoal	25.00	@ 30.00,	"
Bessemer Pig	23.50	@ 24.00,	"

It is rumored that sales of Bessemer Pig have been made at $25, cash, but, if true, it must have been of a special analysis and for a particular delivery, as brokers say ordinary grades of Bessemer can still be had at $24, cash. Delivery is an important item in this connection; a furnace-man might be willing to sell for January at $24 and refuse $25 for April or May, and if any sales have been made at $25 it must have been for delivery a good way off.

Muck-Bar—Continues rather quiet, although it is firmer in sympathy with the increased cost of Pig-Iron; it may be quoted at $31 @ $31.50, cash, for January and February. So far as we know there have been no sales above $31.50, cash, but some mills are now refusing to sell under $32. There are parties here who are making a specialty of Muck; they furnish the Pig-Iron and pay the mills so much per ton for converting it into Pig-Iron; some of the Wheeling mills have been employed in this way for several months. It is thought that the shortage of natural gas if continued will inprove the demand for Muck. Be this as it may, it is generally conceded that at present prices Muck-Bar is cheaper relatively than Pig-Iron.

Manufactured Iron.—Demand continues active, which may be attributed largely to an apprehension on the part of buyers that prices are destined to go still higher, and they are anxious to get their orders placed ahead of the advance. December is ordinarily a quiet month, but the present one for the reason noted, is an exception to the rule. As noted in our last report, manufacturers generally are refusing to contract for future delivery at present prices. They are willing to book orders ahead, but with the understanding that they are to obtain prices current on time of delivery, whatever they may be. Prices may be fairly quoted as follows: Bars, 1.90¢ @ 2¢; Plates, 2.40¢ @ 2.50¢; No. 24 Sheet, 3¢ @ 3.10¢; Skelp-Iron, 1.80¢ @ 1.90¢ for Grooved and 2.15¢ @ 2.25¢ for Sheared. Structural Iron: Angles, 2.45¢; Tees, 2.95¢; Beams and Channels, 3.10¢; Sheared Bridge-Plates, Steel, 2.85¢; Universal-Mill Plates, 2.55¢.

Nails.—The market for Cut Nails is stronger, and during the past week prices have been advanced 10¢ ℔ keg; we now quote at $2.35, 60 days, 2 % off for cash, and manufacturers are still refusing to contract ahead, from which it is evident that they are looking for a still further advance. At present price of Steel Slabs Nails it is

contended should not be less than $2.50, and it is probable that the price will again be advanced within the next week or two. Wire Nails quoted at $3 rates.

Wrought-Iron Pipe.—There is a continued good demand, especially for this season of the year, mills are all fully employed; it appears that there is a good deal of work involving the use of Pipe that is now prosecuted in winter as well as at other seasons of the year, and this accounts for the demand keeping up at the present time. Prices firm but unchanged. Discounts on Black Butt-Welded, 50 %; on Galvanized do., 42½ %; on Black Lap-Welded, 62½ %; on Galvanized do., 50 %; Boiler-Tubes, 1¼-inch and smaller, 50 %; on 2-inch and larger, 55 %; Casing, 5¾ inch, 55 %. The regular monthly meeting of the association takes place in this city this week, and there is a probability of prices being advanced, although one of our large manufacturers informs your correspondent that he would oppose an advance at the present time.

Old Rails.—No sales of Old Iron Rails reported the past week, in the absence of which we contine to quote at $27.50 @ $28. The last sale reported was at $28. We are advised of several sales of Old Steel Rails, involving some 1200 or 1500 tons, at prices ranging from $23.35 to $23.50 and $24. There has been an increasing demand for the latter for several weeks past, and they have advanced as much if not more than Iron Rails.

Railway-Track Supplies.— Demand continues rather light, but is expected to improve early in the new year. Prices, however, are firm and the probability is will go still higher within the next week or two. Spikes, $2.15, 30 days, on cars here and $2.25 at Chicago and St. Louis. Splice-Bars, 2.10¢ @ 2.15¢; Track-Bolts, 3.10¢ with Square and 3.20¢ with Hexagon Nuts.

Wire-Rods.—Steel Wire-Rods quoted firm at $52 ℔ gross ton.

Merchant Steel.—A fair business reported, but prices remain unchanged. Tool Steel is quoted at from 8¢ ℔ lb up, according to quality; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth Steel, base sizes, 2¾¢ @ 3¢; Bessemer Machinery Steel, 2¼¢; Tire Steel, 2.3¢ ℔ lb rates

Steel Rails—Are now quoted at $35 @ $36, cash, at mill, as to size and character of order, as well as delivery.

Billets and Blooms.—There appears to be no abatement in the demand and prices are still tending upward. We now quote at $35.50 @ $36.50. Some sales for future delivery reported at $37 @ $37.50.

Old Material.—There is an increasing demand and prices are still on the ascendency. Sales of No. 1 Wrought Scrap reported at $22.50 @ $23, net ton; Car-Axles, $29 @ $30; Cast Scrap, $16, gross ton; Steel Bloom and Rail Ends, $23.50 @ $24; old Car-Wheels, $20 @ $20.50, Crucible Steel, $30.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, December 17, 1889.

Following the selling out practically of the greater part of the Lake Bessemer Ore to Western furnaces, very few Eastern works receiving any of it, covers the report of very heavy transactions in foreign Iron for Eastern furnaces, and the sale of considerable Eastern domestic Bessemer Ore. At the same time there are reports that the large Eastern steel-mills have purchased large blocks of Bessemer Pig, some of the furnaces having practically sold next year's output, the price ranging upward to $22.50. It is clear that the large Eastern mills have now pretty thoroughly covered their requirements for raw material for the greater part of next year.

American Pig.—The volume of new business in Foundry Iron continues light. Some moderate sales are being made for delivery early in 1890 on the basis of $19.50 for No. 1, the Iron coming chiefly from parties who purchased at low figures and are realizing profits. For early delivery, in a moderate way, sales of Northern and Southern Iron are being made at $19 @ $20, while noted brands are fetching more. The majority of sellers maintain their attitude of expectancy, the large concerns who have named prices asking $20 or upward for delivery during the first quarter of 1890. A leading company have sold to consumers—Pipe-founders—for 1890 delivery 10,000 tons of Gray Forge at $17.50 at furnace—equal to $18.20 at tide. The same concern have received an inquiry for 10,000 tons of Pig-Iron for shipment to England, at the buyer's option over a considerable period, the buyer depositing a margin of $4 ℔ ton. The matter has not been closed, however, at this writing. We continue to quote $19 @ $20 for No. 1, with the market strong and in sellers' favor.

Spiegeleisen and Ferromanganese.—Spiegeleisen has become quiet and nominal, quotations ranging from $36.50 to $38.50 for 20 % In Ferromanganese business has been restricted, $95 @ $98 being quoted by different importers.

Billets and Slabs.—There are a number of large inquiries in the market, but Eastern mills are unable to take care of them for the present, being full for the first four to six months of next year. Among the recent sales we note one lot of 5000 tons of special Billets at $40 at Eastern mill.

Steel Rails.—The market continues very quiet, East and West, sales being confined to small lots, for which $35 or a shade under is being realized by the Eastern mills. Outside lots and resales which have been a slightly disturbing factor in the trade for some weeks past appear to be out of the way now. Rails resold by roads not needing them cannot of course fetch full prices, because their market is limited to those buyers who happen to be able to get along with the particular section, &c. The prices made on them are not a fair criterion of the market for that reason. Inquiries which mean early business are not numerous or important, the only large one in the market being one lot of 24,000 tons for all 1890 delivery, by the receiver of a Southwestern road. The last report of the Board of Control shows that the sales for 1890 delivery of the mills, excepting one not in the association, aggregated about 560,000 tons on December 1. It is probable that this does not include a number of transactions really if not formally closed. It is safe to estimate that the sales to date are not less than 700,000 tons. By far the greater part of these purchases are to cover renewal requirements of old roads, with some entire sections and some important lines still to hear from. The demand for new mileage is the unknown factor. If it is only up to the average—say 5000 miles—the tonnage for the coming year will not be very much greater than it was this year. If it is more, present prices, in view of the demand for Steel for other purposes, will seem moderate a few months hence. The course of the money market and the financial situation generally will have the greatest influence on the situation. There are generally a large number of schemes sufficiently ripened to avail themselves of conditions favorable to the placing of bonds and other securities. The shipments of Rails in 1889 have been very near those of 1888, having been 1,116,788 tons in the latter year and 1,116,017 this year. In 1889, however, the make of the Allegheny Bessemer must be added. In 1888 the total production, including Light Rails, not embraced in the statistics of the Board of Control, was 1,364,447 gross tons. It is probable, therefore, that this year's product will be about 1,450,000 gross tons.

Wire-Rods.—We hear of no new business, mills quoting $55 @ $55.50 for later delivery New York, and $53.50 @ $54 for earlier delivery.

Old Rails.—It is reported that during the week the greater part of the stock in this market has changed hands, the quantity aggregating about 3000 tons, at rising prices up to $27, and upward.

An inquiry has come into the hands of merchants here which is interesting as showing how for the moment the usual relations between European and American markets have been reversed. An English house has asked for prices on an aggregate of 65,000 feet of Wrought-Iron Pipe. It is believed that business can grow out of it. As an example, the English list-price on 1½-inch Pipe is said to be 1/4 with 65 and 2½ % off, which would be equivalent to 11¢. The American price is 23¢ with 62½ % off, which would be equal to 8.63¢. We understand that the inquiry is for the Continent.

Financial.

Commercial circles manifest much activity, more than is usual in the closing month of the year, but there is a gradual subsidence with the approach of January 1, 1890. Interest, however, is weakening with the opening of Congress, particularly with reference to tariff revision, it being announced from Washington that this subject will receive prompt action at the hands of the Ways and Means Committee, who have already set days for hearings on different articles of the schedule. A feature of the times is the extraordinary pressure of grain and other freight upon the Western railroads, whose rolling-stock is unequal to the emergency. In consequence traffic at various points is seriously deranged. Eastward shipments from Chicago exceeded 100,000 tons, against 80,000 tons the previous week. In the rubber market much excitement was occasioned by the action of the Brazilian Government in granting an exclusive concession to the Mercantil Companhia, of Para, who obtained a reduction of 1 % in export duties, accompanied with a guarantee that the market shall remain at 78¢ or higher. Respecting business in the new republic a Rio banker telegraphs that the customs duties collected are largely in excess of those for the corresponding period of last year and that all is tranquil. The unseasonably mild weather has a depressing effect in some branches of trade and among the coal operators it is a peculiar hardship, tending to aggravate the situation. Speculative trading in coffee is brisk and goods are held at a full valuation. Sugars are weak and for refined there is a reduction of ¼¢. Cotton goods continue strong and additional upward price changes are looked for. Print cloths, on the contrary, declined. Woolens are slow. Cotton is dull. Breadstuffs are steady; spot wheat very slow, in the absence of export trading; corn barely steady. Deliveries of wheat at interior points exceeded 3,000,000 bushels, against 1,913,000 bushels for the corresponding week last year. The rice crop on the Atlantic Coast amounts to 190,000 barrels, as compared with 145,000 barrels last year. The clearings of 42 cities last week show an increase of 8.9 %, New York gaining 7.6 % compared with the same week in 1888. Ocean freight rates are full and on a profitable basis, with contracts for considerable tonnage up to March.

The Stock Exchange markets have been dull. On Thursday there was a further break in sugar certificates, but next day there was heavy bidding at higher quotations. For the first time in a long period the Refineries Company appeared as a loaner of money, placing over $1,000,000 at 6 %, four months. Respecting the trusts generally, it was remarked that they are having a hard time of it. The evident determination of the courts to put an end to this form of monopoly and the complications certain to grow out of their judicial winding up naturally deter people from buying. Saturday's bank statement stimulated a rise in the final dealings. On Monday Reading was freely sold on the announcement of the death of ex-President Gowen, and the whole list was affected. On Tuesday the coalers were steady to firm. The story was repeated that the Coxe suit against the Lehigh Valley will be compromised, so as to avoid the necessity of a ruling from the Interstate Commission.

United States bonds were firm at quotations as follows:

U. S. 4½s, 1891, registered	104⅝
U. S. 4½s, 1891, coupon	104⅝
U. S. 4s, 1907, registered	126
U. S. 4s, 1907, coupon	127
U. S. currency 6s	115

The bank return for the week shows an increase of $1,927,500 in reserve, which now stands at $2,630,650 surplus. The loans show a contraction of $4,132,200, and the deposits other than United States decreased $2,987,600. From the foregoing it appears that notwithstanding heavy purchases of bonds by the Treasury, preparations for the payment of semi-annual interests and dividend disbursments absorb large amounts of funds, and the additions to money in circulation are smaller than were anticipated when Secretary Windom announced his policy in regard to the withdrawal of Government funds on deposit with the national banks. The feeling respecting money is therefore unsettled, and when it is considered that, as estimated by a leading member of the Stock Exchange, investors have lost the enormous sum of $60,000,000 through the shrinkage in trusts, the fact should cause no surprise. Time loans are quoted at 6 % for 60 days, and loans are made at 7 @ 8 % collateral for four and six months. Commercial paper quiet. The best double-name paper is quoted at 6 @ 6½ %, and prime single-name at 6½ @ 8 %. Exchange remained unaltered, by the principal drawer, at $4.81 @ $4.85½. There is now an easier feeling in consequence of lower discounts in London.

Secretary Windom has decided not to renew the lease of the Alaska Commercial Company, but will invite bids for the privilege. Chairman Cooley, of the Interstate Commerce Commission, has been compelled to again relinquish his duties in Washington on account of sickness. The new Chief of the Revenue Marine is Capt. L. G. Shepard, lately of the cutter Rush, in Behring Sea. The service comprises 40 vessels, whose duties extend along the entire coast.

The exports of breadstuffs from the United States for the 11 months ended November were $111,811,749, an increase of $8,581,127. The total value of the exports of beef, hog and dairy products from the United States for the month of November was $9,808,289, against $6,335,895 for November, 1888; for the 11 months ended November 30, $105,358,494, against $77,191,435 for the corresponding period last year.

Exports from this port for the week dropped to $5,062,000, while the imports made the large aggregate of $11,703,000, the latter in part due to holiday preparations. Specie exports were $300,000.

Metal Market.

Copper.—At the time of our last week's report spot Copper was cabled £49. 12/ from London and futures £49. 10/; the quotation to-day is respectively £49. 15/ and £49. 10/, sales aggregating 1300 tons during the interval. Business has been moderate in proportions from second hands here, so far as Lake is concerned, at 14¢@14¼¢, main consumers having anticipated their requirements recently till April 1 next, while casting brands have brought 12¾¢@13¢. The export of Ingot Copper during the first ten months has been 12,203,462 lb, against 28,799,150 lb same time last year. Messrs. James Lewis & Son, Liverpool, in their circular dated December 2, say: "Of the 179,000 tons of Copper held by the French syndicate at the time of their collapse, the visible stock in England and France has been reduced to the extent of 22,000 tons, and the invisible stock in France, the United States, Japan, &c., to the extent of about 38,000 tons, or about 60,000 tons in all, during the past eight months. At this rate of reduction, which promises to continue, the stock of Copper—at present almost entirely held by four banks or bankers—will soon be reduced to its normal proportions." The import of American Copper into Liverpool and South Wales during the first 11 months has been 27,901 tons Fine, against 22,562 in 1888 and 14,087 in 1887.

Tin.—London stood £99, spot, and £97. 7/6, futures, when we last reported, and is at present respectively £97 and £96, with sales summing up 1000 tons in the meantime. Our market has been tolerably active during the interval, with a drooping tendency, the decline being 15¢ @ 100 lb, and after sales amounting to 400 tons the quotations at the close are: Spot and January, 21.15¢ @ 21.30¢, and futures to April, 21.15¢ @ 21.25¢. The import of Tin into the United States during the first ten months has been 27,837,298 lb, against 27,600,261 lb last year. The spot quotation for Tin is 21⅛¢ @ 21¼¢. *Tin-Plates.*—Both our own and the foreign markets are a shade weaker for spot Plates, regular sizes, but for contracts running into next year there is no change in makers' views, the uncertainty attending the price of Steel Bars tending to make them very cautious. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5.50 @ $6; Coke finish, $5.20 @ $5.25; Coke Tins, Penlan grade, $4.80; J. B. grade, $4.90 and Wasters, $4.75 @ $4.80. The import of Tin-Plates into the United States during the first ten months has been 640,821,911 lb, against 578,679,200 lb same time last year.

Lead.—The market has been gradually gaining in strength in a healthful manner, and 600 tons have changed hands at from 3.87½¢ to 3.95¢, the closing quotation being 3.95¢ @ 4¢. At St. Louis some business is reported at 3.65¢ and at Chicago at 3.70¢.

Spelter—Has been very firm indeed, 100 tons selling at 5.35¢ @ 5.37½¢, the closing quotation being 5.35¢ @ 5.40¢. Silesian is again 5/ higher in London, now £24. 5/, and may be quoted, nominally, 7½¢ here.

Antimony.—A good business has been transacted at 31¢ Cookson and 23¢ Hallett.

New York Metal Exchange.

The following sales are reported:

THURSDAY, December 12.

25 tons Tin, spot	21.30¢
20 tons Tin, December	21.30¢
10 tons Tin, December	21.35¢
100 tons Tin, December	21.35¢
25 tons Tin, December	21.40¢
20 tons Tin, February	21.45¢
20 tons Tin, March	21.45¢

FRIDAY, December 13.

25 tons Tin, December	21.35¢

MONDAY, December 16.

110 tons Tin, December	21.25¢

TUESDAY, December 17.

25 tons Tin, spot	21.25¢
50 tons Lead, March	3.95¢

Coal Market.

The chronic dullness noted for a long time past is without relief, so that despite the large quantities of Coal which disappear in due course, under contract and otherwise, stocks at shipping ports are accumulating. The persistent "etherial mildness" affords no consolation to the producers and operators—hope is still deferred. The reported production for the week ending 7th inst. is 676,000 tons, which is a slight reduction compared with the previous week. The official statement is as follows:

	Dec. 7, 1889.	Dec. 8, 1888.		Difference.
Wyoming.	333,632	395,180	Dec.	61,548
Lehigh	134,188	136,549	Dec.	2,361
Schuylkill.	208,185	173,148	Inc.	35,037
Total	676,005	704,877	Dec.	28,872
Total for year	33,278,614	36,280,487	Dec.	3,001,873

The Black Diamond, Lancaster and North Franklin collieries, at Shamokin, Pa., have suspended operations for an indefinite period. Four thousand miners are now idle in the Shamokin region.

Quotations remain unchanged, but individuals do not hesitate to cut the recognized schedule. The Western market is reported very dull.

According to Philadelphia advices the Reading and Lehigh companies are crowding Coal upon the market, it is claimed, at full prices. Rumers of a rupture between the managers of the large companies are again rife. The Soft Coal trade is quiet. The full production is maintained at all the mines.

The Philadelphia *Ledger* says: "A movement is actively on foot to establish a 'Soft Coal Trust' to regulate the tide-water Bituminous Coal trade during the coming season. There have been several meetings of representatives from the Clearfield, Cumberland and Southwestern Virginia mining regions, but no details have yet been agreed upon. The amount of the proposed capital of the Seaboard Steam Coal Trust has not yet been determined, but it is variously estimated at from $7,000,000 to $10,000,000. The general plan will be based on that of the Standard Oil Trust."

Wm. S. Jacques, lately president of the New Central Coal Company, has opened at office at Room 200, in the Washington Building. Henry S. Little, now at the head of the company, was formerly one of the receivers of the Central Railroad of New Jersey.

It is rumored in Coke circles that the H. C. Frick Company have purchased the W. J. Rainey plant, consisting of 529 ovens, thus practically dividing the Connellsville Coke region between two great syndicates, the McClure Coke Company and the Frick Coke Company.

A member of the Interstate Commission is quoted as saying: "A compromise is in progress between Coxe Bros. and the Lehigh Valley Railroad which will probably obviate the necessity of a decision being rendered by the commission. Satisfactory rates on Anthracite Coal have been conceded by the railroad, and Bituminious rates are under discussion. It is believed they will be arranged."

A dispatch from Rochester, N. Y., says that about 1000 Coal-miners employed by the Rochester and Pittsburgh Coal and Iron Company at the Walston and Adrian mines, went out on strike.

Cumberland reports for the week ending December 7 72,162 tons; Clearfield, 76,505 tons; Chesapeake and Ohio, 38,898 tons; Pocahontas, 39,716 tons. Cumberland's total since January 1 is 2,926,624 tons, a decrease of 469,000 tons compared with 1888. The market is dull.

Imports.

Hardware, Machinery, &c.

Baldwin Bros. & Co., Gun Barrels, cs., 12
Boker, Hermann & Co., Arms, cs., 27
Baldwin, Austin & Co., Mach'y, case, 1
Barbour Bros. & Co., Mach'y, case 1
Chrome Steel Works, Mdse., cs., 8
Electric Cutlery Co., Mdse., cs., 7
Field, Alfred & Co., Arms, cs., 9
Folsom, H. & D. Arms Co., Arms, cs., 22
French, Anton, Arms, cs., 3
Godfrey, Chas. J., Arms, cs., 3
Hammacher, Schlemmer & Co., Nails, cs., 39
Hartley & Graham, Arms, &c., cs., 27
Mette, Robert, Mach'y, cs., 11
Pratt & Farmer, Hardware, cks., 5
Schoverling, Daly & Gales, Arms, cs., 15
Van den Toorn, W. H., Arms, cs., 7
Werlemann, H., Arms, cs., 33
Ward, Jas. E. & Co., Mach'y, pcs., 84; do., bxs., 15
Wiebusch & Hilger, Lim., Arms, cs., 3
Order—Hardware for Jamaica, pgs., 77; Cutlery, cs., 21; Mach'y, cs., 5

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, December 18, 1889.

Operations in Pig-Iron were on a reduced scale during the early part of the week, and prices showed a declining tendency, more particularly on warrants. Speculative interest has improved only slightly since that time, but transactions for trade account have increased considerably, and the general market is now quite strong. Hematites are particularly well supported, and there is faith in the future of that commodity, owing to the present activity and flattering prospects in the Steel trade. Cleveland Pig has continued to be purchased sparingly for consumption, but speculation has carried prices for the same above the quotation for Scotch warrants, after a temporary setback. The exports of all descriptions of Iron to the States last month were 105,000 tons, against 137,000 tons in November, 1888.

The Tin-Plate market is steadier, with 15/9 now considered a strictly inside price for Cokes. Buyers experience difficulty in placing orders at this figure, as makers are full at present and confident that prices will go higher. It is stated that two-thirds of the entire available stock is stored at Swansea. The exports to the States last month were 315,000 tons against 271,000 tons a year ago.

Block Tin experienced a flat market early in the week and price for prompts receded to £96. 2/6. Subsequently active buying for speculative account advanced the price to £98. 5/. From that point there was a subsequent reaction of 15/ on realizations. A further reduction in stocks would doubtless cause a positive scarcity of Tin for trade wants and lead to much higher prices for prompts, but the report is general that the shipments from the Straits will give a full supply, under which circumstance present prices are considered too high. Futures are quite freely offered.

Merchant-Bar Copper, after declining to £48. 10/ for prompts, reacted speedily to £49. 17/6 on demand to cover short sales. Consumers bought more reservedly at the higher figures and the market consequently weakened somewhat. The movements of the holders of French syndicate stock are extremely difficult to follow, but the meager facts coming to the surface indicate that they realize quietly when favorable opportunity offers, avoiding the open market in London as much as possible.

Calcining in Spain is again becoming seriously discussed in all its details by the Council of Ministers, who, it is reported, have decided that on January 1 the quantity of Ore treated shall be reduced one-half from the present amount. A commission of engineers has been appointed to see that the law is carried out. The action is considered a serious matter for the Rio Tinto and other Spanish companies. The appeal of the case of the Rio Tinto Company *vs.* the Comptoir de Paris, to recover moneys from the latter on guarantee given in favor of the Société des Métaux was dismissed without calling defendants' counsel.

General prospects in the Copper trade are considered excellent.

Chili charters for first half of December 900 tons. Stocks have decreased the past fortnight to the extent of 1289 tons. The arrivals of Matte from the United States during the first half of the month were 1600 tons. None has been shipped to France. Transactions in furnace material exceedingly small; 400 tons Anaconda Matte at 10/4½, the only sales reported of American for the past fortnight.

Scotch Pig.—In makers' Iron there has been a fairly active trade, with prices firm for best brands, but irregular on others.

No. 1 Coltness,	f.o.b. Glasgow	.. ..	79/6
No. 1 Summerlee,	"	"	79/
No. 1 Gartsherrie,	"	"	78/
No. 1 Langloan,	"	"	78/
No. 1 Carnbroe,	"	"	67/6
No. 1 Shotts,	"	at Leith.....	77/6
No. 1 Glengarnock,	"	Ardrossan.	77/6
No. 1 Dalmellington,	"	"	70/
No. 1 Eglinton,	"	"	65/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—Business in this article still moderate and prices 1/ @ 1/6 lower than a week ago. No. 3 Middlesborough quoted 60/6 for prompt.

Bessemer Pig.—The demand continues brisk and makers are very firm, quoting West Coast brands, mixed numbers, at 77/6, f.o.b. shipping point.

Spiegeleisen.—There is still a good demand and sellers are very firm. English 20 % quoted 97/6 @ 100/, f.o.b. at works.

Steel Rails.—No material change has taken place, the demand being good and sellers firm. Heavy sections quoted at £7 and light sections £7/5 @ £7. 15/, f.o.b. at N. W. England shipping point.

Steel Blooms.—Former prices are firmly adhered to and the demand continues fairly active. We quote £6. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There is still a good demand and prices remain very firm. Bessemer, 2½ x 2½ inch, £6. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Prices about the same as last week and the market firm. Bessemer, £6 @ £6. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—There is but little doing and buyers and sellers are far apart Tees quoted at £3. 7/6 @ £3. 12/6 and Double-Heads £3. 10/ @ £3. 15/, f.o.b.

Scrap-Iron.—The market is quiet and prices are without important change. Heavy Wrought quoted £3 @ £3. 5/.

Crop Ends.—Prices irregular and little business passing. Bessemer quoted £3. 12/6 @ £3. 15/, f.o.b.

Tin-Plate.—The demand somewhat improved, but buyers and sellers apart. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	@ 18/
IC Bessemer Steel, Coke finish.... ..	16/3 @ 16/6
IC Siemens " " "	..16/6 @ 16/9
IC Coke, B. V. grade	..15/9 @ 16/
Charcoal Terne, Dean grade.....	..15 9 @ 16/

Manufactured Iron.—There is still a fair business and prices remain firm. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	9	10	0	@	0	0	0
" Common "	8	9	0	@	8	10	0
Staff. Bl'k Sheet, singles...	0	0	0	@	10	0	0
Welsh Bars (f.o.b. Wales)...	7	12	6	@	7	17	6

Copper.—Business fairly active and the market firm. Chili Bars quoted at £49. 10/, spot, and £49. 2/6 three months' futures. Best Selected, £56.

Tin.—The market quiet to-day, but prices fairly firm. Straits quoted at £97. 7/6, spot, and £96. 7/6 for three months' futures.

Spelter.—The market firm, with demand fair. Quoted at £24 for Ordinary Silesian.

Lead.—There has been more business and the market is firmer at £14. 2/6 for Soft Spanish.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Pittsburgh

In regard to raw material there has been less activity this week, and the probability is that this will continue until after New Year. The firmness noted for some weeks past continues. All kinds of finished Iron and Steel firm, and will go higher At Sheriff's sale, at works of Long & Co., 550 tons of Bar-Iron were sold to Brown & McClure, of Boston, at 1.86¢.

Cleveland.

After having sold very large quantities of Ore at $6.50, f.o.b. vessels at lower lake ports, the Republic Company to-day raised their prices to $7. Other Bessemer mines have also increased their quotations and announced that they have sold about all the Ore they choose to dispose of until after the annual meeting in January and the inspection of the mines. The quantity already sold is enormous. During the past three or four days very heavy demands have been made for non-Bessemer Ore. Several round lots have been disposed of.

Chicago.

Heavy consumers of Pig-Iron are in the market for next year's supply, but their views seem to be so far below the ruling prices that no immediate transactions may result. The market here is much quieter and less excited than those further east. The only change in Pig-Iron prices this week is an advance of 50¢ ₹ ton on American Scotch. Bar-Iron is very firm and higher prices are expected. Old Rails have been sold at slightly lower prices in small quantities. The mills are now receiving shipments more promptly, and the market is therefore easier. There has been no change in any other respect.

Philadelphia.

The market is very strong to-day and everything is held at outside figure. The offerings are small and higher figures are

generally expected. The store price of Bars has been advanced to 2.2¢ and mills are firm at 2¢. Other articles are unchanged, but strong.

Cincinnati.

But little trading has been indulged in since Monday, yet buyers are continually testing the market for Pig-Iron in one way or another. No disposition is evident to relax prices, and while 17,000 tons speculative holdings of Southern Mixed Forge and Foundry grades are offered for delivery beginning in January, holders demand full values. At the same time, buyers for such an amount recognize a desire to sell and bid less than smaller amounts have sold for. Aside from the circumstances attending the offering of this speculative lot the general features remain as set forth in the letter. Old Wheels have been sold at $19.50 @ $20, cash, Cincinnati basis.

St. Louis.

Pig-Iron.—The near approach of the end of the year precludes the possibility of any large transactions in Pig-Iron, and consumers are only buying for immediate requirements. Prices are firm and sellers show no disposition to cut rates to secure trade. There is no change to report in either Barb-Wire or Bar-Iron.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

BRAZIL.

PARA, December 13, 1889.—*India Rubber.*—Prices and exchange unaltered; the market firm. The Companhia Mercantil, of Para, got a concession from the Provincial Government of 20 reis ℔ kg. upon the entire export of Rubber from Para, which is 30,000,000 pounds per annum, to date from the 1st prox., constituting a bonus of $150,000 a year, in return for which the company engage to keep Rubber at a uniform price in Para. Exporters have combined for a joint protest to the Brazilian Government and foreign ministers.—*Per cable direct.*

EAST INDIES.

PENANG, October 29, 1889.—*Tin.*—Receipts for the fortnight amount to 14,000 piculs, while the sales to Europeans reached 12,754 and to Chinese 2000. Opening at $33.55 ℔ picul, the market, after some slight fluctations, closed at $33.90.—*Schmidt, Kustermann & Co.*

MANILA, December 9, 1889—*Hemp*—Our market has ruled firm at $15 ℔ picul, against $14 same date last year, equaling ℔ ton, cost and freight, £47. 15/, against £47. 13/. Clearances for the United States since January 1 have been 174,000 bales, against 229,000 in 1888, while there remain loading 41,000, against 37,000; cleared for England since January 1, 301,000 bales, against 330,000; cleared for all other ports, 47,000, against 68,000; receipts at all ports since last cable, 5000, against 11,000, and since January 1, 532,000 bales, against 619,000 in 1888 and 512,000 in 1887. There is a good supply of *Freight*, the quotation for Hemp being 85.50, against $7 in 1888. *Exchange.*—Six months' sight on London, 3/5⅝, against 3/7¾,—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street*

COLOMBO, CEYLON, November 7, 1889.—*Plumbago*—Has continued firmly sustained at the following quotations in rupees ℔ ton: Large Lumps, 220 @ 250; Ordinary Lumps, 200 @ 230; Chips, 115 @ 135, and Dust, 85 @ 100. *Ebony.*—There have been no sales; the nominal quotation is 150 @ 200 rupees ℔ ton. Plumbago shipments have been distributed as follows since October 1: To England, 10,056 cwt.; to Hamburg, 600; to Bremen, 368, and to the United States, 19,672, together 30,695 cwt., against 14,994 last year, 12,351 in 1887 and 31,924 in 1886. *Exchange.*—Six months' sight on London, 1/5 3-16.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street*

SPAIN

BILBAO, November 30, 1889.—*Iron Ore*—Has been dull at 8/6 @ 8/7. Rubios Superiores on the spot and Campanil at 9/9, the closing quotations being nomially 8/6 @ 8/9 the former and 10/ @ 10/6 the latter, for large lines. The bad weather has delayed shipments somewhat; still some 60,403 tons left the harbor for abroad. Since January 1 3,528,896, against 3,563,652 in 1888 and 3,912,729 in 1887. *Pig-Iron*—Gave way slightly in price and then recovered, now being quite firm. The shipments were 500 tons abroad and 540 coastwise. Freights are well sustained.—*Bilbao Maritimo y Comercial.*

RUSSIA.

ODESSA, December 5, 1889.—*Petroleum.*—During the first nine months Baku exported 30,720,864 puds of Naphtha products of 36 lb American, 24,666,751 thereof being refined Petroleum. The shipments of Naphtha products inland reached 101,515,039 puds, while the Transcaspian region received 149,029 puds. Negotiations have been going on between the Government and the firm of Nobel Bros. for the acquisition by purchase of the latter's Baku Petroleum plant, supposed to be worth about 10,000,000 rubles.—*Journal de St. Petersbourg.*

BELGIUM.

BRUSSELS, December 6, 1889.—*Iron.*—It is difficult to fix the precise ruling of the official figures of the syndicate. It is conceded that Merchant Iron cannot be had for less than 18 francs ℔ 100 kg. Forge Pig has been selling at 8.50 @ 9 francs ℔ 100 kg. Athus sold out his entire output up to July 1 next. This is the only large blast-furnace owner who could possibly have had some Pig to spare, and he has none to dispose of till that date. Beams are 18 @ 20, against 14.50 @ 15 on October 26.—*Moniteur des Intérêts Matériels.*

The New Torpedo-Boat Cushing.

The coming trial-test of the torpedo-boat Cushing, just completed by the Herreshoffs, will be watched with considerable interest, since it is expected the boat will beat the records made by the famous Thornycroft torpedo-boats. The Cushing is wholly American in design and construction with the exception of the boiler, which is from the works of Thornycroft. It was originally supposed that the Herreshoffs would put into the boat one of their own boilers. In fact, they intended to do this up to the last moment, when they were about to announce the boat ready for trial. For some reason the firm suddenly asked permission of the Navy Department to substitute an English Thornycroft boiler for one of their own make. The Navy Department granted the request, though it is understood that the acquiescence was made reluctantly. The machinery, however, is Herreshoff in construction, as are also the hull and all the fittings. The contract made by the Navy Department with the Herreshoffs specified that the new torpedo-boat should be ready for trial by May 1, 1889. The craft would have been ready by the time specified had not the change in the boilers been allowed.

In point of structure, general dimensions and speed-powers the Cushing has been designed and built very close in all particulars to the torpedo-boats Ariete, Rayo and Coureur. These vessels are 147 feet 6 inches long by 14 feet 6 inches beam, with a displacement of 98.75 tons on a draft of water of only 4 feet 11 inches. In appearance they resemble somewhat the 25 first-class sea-going torpedo-boats built by the Thornycrofts for the British Admiralty in 1886. The guaranteed speed in all these vessels was 25 knots an hour on the measured mile and 23 knots on a run of two hours' duration. On their official trials the Ariete did 26.003 knots on the measured mile and 24.9 knots on the two hours' run, and the Rayo 25.52 knots on the measured mile and 24.63 knots on the two hours' run, while the Coureur, which was tried at Cherbourg, from some cause which Mr. Donaldson, Thornycroft's chief engineer of construction, says he was unable to discover, only did 23.5 knots on the measured mile and 23.6 knots on the two hours' run.

In South Brooklyn recently there was launched a yacht that is aimed to embody the principle of propulsion from a stream of water forced from the stern. The boat measures 108 feet in length; beam, 23 feet; draft, 6½ feet. It is the property of Dr. W. M. Jackson, and will be known as the Evolution. The yacht will be run by hydraulic power secured by pumping water in through 8-inch pipes and out through ¾-inch pipes. She is expected to make between 25 and 30 miles an hour. There will be no rudder, as the yacht will be steered by the deflection of the stream of water.

There was but one bid received at the Navy Department on Monday for the 661 tons of protective-deck plating for the battle ship Texas, that of the Linden Steel Company, of Pittsburgh, at $102,164.16 for the whole amount.

The heavy guns for the new vessels of the British navy have been successfully tested. They are constructed on the breech-loading sytem, and can send a projectile weighing 1250 pounds through 26 inches of wrought-iron at a distance of 2000 yards.

Steps are being taken to raise in Philadelphia the capital for establishing works on the Delaware River for the manufacture of heavy steel guns under the patents of Dr. R. J. Gatling. The company were chartered in West Virginia, and their capital is $1,000,000. Congress has made an appropriation of $6,000,000 for heavy guns, and the intention is to make 6, 8, 10 and 12 inch guns, both for coast fortifications and for naval warfare.

The population of the 12 Southern States as estimated by the several State comptrollers, after careful inquiry, now numbers 19,489,150, against 14,638,938 in 1880, being an increase in the ten years of over 35 per cent. The most rapid is in Florida, Arkansas, Texas and Georgia in the order named. The whites number 12,218,420, the blacks 7,270,720. The white population of the South, according to these estimates, has increased a little over 3,200,000, while the colored population shows an increase in the ten years of about 1,600,000.

Charles Cramp, of the ship-building firm of Cramp & Sons, of Philadelphia, was before the Senate Committee on Naval Affairs to-day in relation to Senator Hale's bill to increase the naval establishment. Mr. Cramp said that if his firm were given the contract for building all the ships proposed they could complete the work in five years. There were, he said, half a dozen other ship-building establishments in the country at which from one to three of the ships can be constructed. Two of these are located on the Pacific Coast.

The new hydraulic valve for regulating the recoil of heavy guns, invented by W. G. Armstrong-Mitchell & Co., of England, and tested at the Camperdown's gun trial, has met with general approval and is to be fitted to all future heavy-gun mountings.

The Woodstock Iron Company, of Alabama, have sold the Anniston and Atlantic Railroad for $1,000,000.

Hardware.

Holiday and seasonable goods have a prominent place in the business doing, but a good many orders for general Hardware are also being accepted for next season, many buyers being convinced that nothing is likely to be gained by deferring purchasing, as in their judgment prices are not likely to be lower, and in many lines will probably advance. On this account the amount of business during the past few weeks has been considerably larger than usual. There are some indications of increased firmness in general Shelf Hardware, the manufacturers of which have pursued a conservative policy in refraining from announcing a general advance. Some goods are, however, higher, and it is not unlikely that within the next week or two there will be further advances.

Wire Nails.

The market has developed no new features and the failure of the efforts to organize the Federal Steel Company, which, if the plans had been carried out, would have affected Wire Nails certainly as much as Barb-Wire, has not resulted in more than a slight effect on the tone of the market. The price remains as it has been for several weeks, $2.90 to $3 for carload lots at factory. Some of the manufacturers are more willing than others to fill orders for smaller lots at figures that closely approximate the above.

The sale of 28,000 kegs to a Western house is reported at a concession from the figures named above.

Cut Nails.

The New York market continues quiet, but firm, at $2.10 for Iron Nails in carload lots, on dock. Thus far there has practically been no speculation. Raw material continues to rise.

A meeting of the Western Cut-Nail manufacturers was held in Wheeling, W. Va., on the 13th inst. The attendance was large, about 15 firms being represented. After a full discussion on the condition of trade, it was decided to advance the base price from $2.25 to $2.35, less 10 cents per keg in carload lots, 2 per cent. off for cash. The new price went into effect on the date of the meeting.

Barb-Wire.

The Barb-Wire market is without important change, the following being the New York prices: Galvanized Four-Point, 4.2 cents per pound in small lots, 4 cents for 3-ton lots and 3.9 cents for carload lots, with the usual deliveries. The transactions, as usual at this time of the year, are limited in amount, and the trade are not disposed to purchase in anticipation of further advances. The price is, however, firmly adhered to and the market has a strong tone.

Miscellaneous Prices.

On account of the continued increase in the cost of material and labor, we are advised that the prices on all Eagle Anvils will be advanced after January 1.

Owing to the condition of the market the price of Axles, as of many other heavy goods, is very firm, and advances have recently been made. If there are further advances in the raw material the price of Axles will certainly be higher, and this is not unlikely to occur if Iron simply holds its own.

The manufacturers of Brass Cocks and other goods of this line are conferring with a view to reaching an understanding by which an advance can be made. The price of Copper requires such action on their part, and it is thought likely that higher prices will soon be announced. Something has already been done in plumbers' goods, and this line is also regarded as firm and strong.

The conferences to which we have already alluded between the manufacturers of Sand-Paper have not resulted thus far in the reaching of an agreement, and the market remains substantially as it has been for some time past.

The Wire market remains steady at the lately advanced prices, the manufacturers being fully occupied with orders. In this line there have been, as the trade are aware, successive advances until the present price is more than 60 per cent. higher than that which prevailed early in the fall.

In this condition of things the prices of Wire-Netting and all goods made largely of Wire are very firm, and advances are making from time to time.

Manufacturers of Machine-Bolts, Bolt-Ends and Lag-Screws have made an advance of from 5 to 10 per cent., and the new prices are regarded as very firm. There is a probability that a change will be made January 1 in the list prices of Machine-Bolts by advancing the larger sizes, so that the whole list will be subject to one discount.

An advance of 5 per cent. has been made in the price of Elliptic, Concord, Platform and Half-Scroll Springs.

The manufacturers of Axes had a meeting in this city last week, in which the advance of prices was considered. It was, however, found inexpedient to take the contemplated action, and prices remain without change.

The manufacturers of Nuts are in session in this city to-day, and among other matters the question as to the advisability of advancing prices is receiving attention.

As a seasonable article, the trade who are not supplied with Snow Shovels will be interested in the advertisement on page 57 in which Gifford Mfg. Company, Watertown, N. Y., illustrate Whitney's patent. It is stated that the company have purchased the exclusive right for the manufacture of this Shovel.

Guarantee of Prices.

The following question in regard to business has been brought to our attention, with the suggestion that the views of the trade will be valued in regard to it. We shall be pleased to hear from our readers on the subject:

Wholesale agent A ordered in May, 1889, of manufacturer B 100 cases of goods at 50 per cent. discount, order reading "Quantity to be taken by December 31, price guaranteed against yourselves to date of shipment." During the summer the price of these goods declined to 60 off, and remained at this price until about November 1, at which time B's best price was 50 and 5 per cent. discount, that being the price prevailing to-day. A now wants the goods shipped and claims they should be billed at 60 per cent. B claims that they should be billed at 50 and 5. Which of the two parties to the transaction is right?

Tacks.

Another advance has been made by the associated manufacturers. It is represented in the accompanying discount-sheet issued by Loring & Parks, Plymouth, Mass., for whom John H. Graham & Co., 113 Chambers street, New York, are agents. The prices given are subject to an additional discount of 10 and 2 per cent. for cash:

Goods, papered, dozened and M's.	Straight * Weights.	Star ** Weights.	Standard *** Weights.	Special **** Weights.
American Carpet Tacks, Blued	70 %	70&5 %	72½&5 %	.....
American Carpet Tacks, Tinned and Coppered	70 %	70&5 %	72½&5 %	75&5 %
Steel Carpet Tacks, Bright and Blued	70 %	70&5 %	72½&5 %	.....
Steel Carpet Tacks, Tinned and Coppered	70 %	70&5 %	72½&5 %	75&5 %
Swedes Iron Carpet Tacks, Blued	70 %	70&5 %	72½&5 %	.....
Swedes Iron Carpet Tacks, Tinned	70 %	70&5 %	72½&5 %	.....
American Iron Tacks	67½ %	67½&5 %	70&10 %	.....
Swedes Iron Tacks, S. S., Blued	70 %	70&5 %	71½&5 %	.....
Swedes Iron Tacks, S. S., Tinned	70 %	70&5 %	71½&5 %	.....
Swedes Iron Tacks, Lanc., Blued	66⅔ %	66⅔&5 %	70&5 %	.....
Swedes Iron Tacks, Lanc., Tinned	66⅔ %	66⅔&5 %	70&5 %	.....
Gimp and Lace Tacks, S. S., Blued	70 %	70&5 %	72½&5 %	.....
Gimp and Lace Tacks, S. S., Tinned	70 %	70&5 %	72½&5 %	.....
Gimp and Lace Tacks, Lanc., Blued	66⅔ %	66⅔&5 %	70&5 %	.....
Gimp and Lace Tacks, Lanc., Tinned	66⅔ %	66⅔&5 %	70&5 %	.....
Basket and Trimmers' Tacks, Lanc.	62½ %	62½&5 %	67½ %	.....
Hungarian Nails	62½ %	62½&5 %	67½ %	.....
Miners' Tacks, S. S.	75 %	75&5 %	77½ %	.....
Miners' Tacks, Lanc.	70 %	70&5 %	72½&5 %	.....
Common and Patent Brads	60 %	60&5 %	65 %	.....
Leathered Tacks	40 %	40&5 %	45 %	.....
Brush Tacks	50 %			
Looking-Glass Tacks	50 %			
Picture-Frame Points	50 %			
Copper Tacks	50 %			
Carpet Tacks, blued, by the count	70 %			
Carpet Tacks, Tinned, by the count	70 %			

These are not packed in other weights.

Pounds, Pound or Half-Pound Paper or Bulk.

Swedes Iron Tacks, Lanc., Blued	66⅔ %
Swedes Iron Tacks, Lanc., Tinned	66⅔ %
Swedes Iron Tacks, S. S., Blued	70 %
Swedes Iron Tacks, S. S., Tinned	70 %
Gimp and Lace Tacks, Lanc., Blued	66⅔ %
Gimp and Lace Tacks, Lanc., Tinned	66⅔ %
Gimp and Lace Tacks, S. S., Blued	70 %
Gimp and Lace Tacks, S. S., Tinned	70 %
Trimmers' Tacks, Lanc.	26½ %
Basket Tacks, Lanc	62½ %
Finishing Nails	65 %
Trunk & Clout Nails, Black	66⅔ %
Trunk & Clout Nails, Tinned or Coppered	66⅔ %
Hungarian Nails	62½ %
Basket Nails	62½ %
Chair Nails	62½ %
Cigar-Box N'ls	50 %
Copper, Trunk and Finishing Nails	50 %
Zinc Glaziers' Points	50 %

Loring & Parks also issue a supplement to their Hardware price-list, in which they

give the prices of different assortments of Carpet-Tacks.

The Tack market is in a much better condition than has prevailed for a long time and prices are well maintained. There is, however, a disposition on the part of many of the manufacturers to give the quantity discounts with some liberality and without insisting in all cases that the requisite quantity of goods is purchased.

Sargent & Co.,

New Haven, Conn., and New York, have issued the following sheet of changes in price since the issue of their discount-sheet, September 10, 1889:

Changes.

Page in 1888 Catalogue.		Discount Per Cent.
248	No. 456, Boston Finish Butts.	85
248	No. Y456, Yeddo Bronzed Butts.	75 & 10
248¼	No. 458, Boston Finish Butts.	85
248¼	No. Y458, Yeddo Bronzed Butts.	75 & 10
250	No. 875, Bronze Metal Butts	70 & 10
258	No. 148, Loose Pin Butts	66⅔
258	No. 149, " " "	66⅔
261	No. 136, Boston Finish Butts.	85
261	No. Y136, Yeddo Bronzed Butts.	75 & 10
262	Nos. K442A and Y442A, Bronzed Butts	80 & 10
263	Nos. K446A and Y446A, Bronzed Butts	80 & 10
264	No. Y433A, Bronzed Butts	80 & 10
264A	No. Y431A, Yeddo Bronzed Butts	80 & 10
264B	No. K431A, Tokio Bronzed Butts	80 & 10
265	No. K436A, Tokio Bronzed Butts	80 & 10
266	No. 836A, M836A. Bronze Metal Butts	70 & 10
267	No. 834, M834, Bronze Metal Butts	75
281	Ratchet Surface Spring Hinges.	55
282, 283	Mortise Spring Hinges	55
New 284	*Change the list* of Extra Springs for Eclipse Springs for repairs: Nos. 1251 1253 1255 1257 $0.40 .50 .60 .70	55
292	Strap and T Hinges	70 & 10
293	Crate Hinges	70 & 10
293	Hinge Hasps	70 & 10
293	Crate Hasps	70 & 10
295	No. 160, Plate Hinges	Net.
295	No. 162, " " "	Net.
296	No. 88, Hook and Eye Hinges	55
296	No. 168, Hook Hinges	Net.
296	No. 98, " "	Net.
297	Nos. 78, 79, Welded H'k Hinges.	55
298	Rolled Blind Hinges	50
302–310	Gate Hinges	60
310	Gate Sockets	60
311	Rhoad's Gate Latches	60
312	Top " "	60
312	Upright " "	60
313	Gate Latches, Nos. 7, 8 and 9	60
314	Barn Door Rollers	60
314	" " Hangers	60
315	New England Barn Door Hangers	6 & 10
315	Sterling Barn Door Hangers	60
315	Wood Track " "	60
317	*Change list* of Barn Door Stays, No. 1 to $2.35	60 & 10
317	Wrought Sliding Door Rail, No. 175	60
318	Tower Bolts	60
318	Barrel Bolts	60
325	No. 304, Neck Bolts	60
327	No. 320, " "	60
330	No. 332, Shutter Bolts	60
330, 331	Shutter Bolts, excepting No. 332	60 & 10
338	Nos. 340, 391, Foot Bolts	66⅔
338	No. 392, " "	66⅔
339	Chain Bolts. No. 380	66⅔
339	" " Nos. 381, 382	66⅔
340	Extra Heavy Chain Bolts	66⅔
352–355	Flush Bolts	55
392	Add new French Window Catches: K3410 K3411 Y3410 Y3411 $21.40 $22.80	60
393	*Change list* of French Window Catches: K3450A K3451A K3452A Y3450A Y3451A Y3452A $23.50 $25.00 $26.50	60
410	Chain Door Fasts	65
424	Japanned Door Handles	55
462	Flush Barn Door Pulls	60 & 10
476A	*Change list* of Drawer Pulls: Nos. 1406 1306 1206 $12.00 $13.00 $14.00	70 & 10
489	*Change list* of Lifting Handles: Inch 2½ 3 3½ No. 7, $8.00 No. 8. 8.50 $9.50 $12.00 Inch 4 No. 3, $17.00 Inch 2½ 3 No. 8, $9.50 $11.00 No. M8. 9.50 11.00	60 & 10 / 60
490	Shelf Box Handles	65
496, 497	Clothes Line Hooks	60 & 10
498, 499	Harness Hooks	60
500	Store Rack Hooks	60
500	Baggage or Harness Hooks	60
503, 504	Coat and Hat Hooks, to screw	60
504	" " to drive	60
504A	Wire Coat and Hat Hooks	60
506	Coat and Hat Hooks, excepting Nos. 28, 38 and 48 (no change). Nos. 28, 38, 48	60 & 10 / 60
509	Coat and Hat Hooks, excepting Nos. 22, 122 (no change) Nos. 22 and 122	60 & 10 / 60
510–512B	Coat and Hat Hooks (no change	60 & 10
513	" " " Nos. 66, 67, 68, no change	60 & 10
	Coat and Hat Hooks, Nos. 57, 257	60
524, 525	Wardrobe Hooks	55
527	Ceiling Hooks, Nos. 32, 132, 33, 133	55
	Ceiling Hooks, Nos. 30, 35, 135 (no change)	60
543–555	Bright Wire Goods	85
560	Nos. 10 and 11 Picture Nails	33⅓
582	Shutter Bars, No. 0	60
582	" " No. T 55, &c	60 & 10
582	" " Nos. 107, 105	60 & 10
583	Shutter Bars: Nos. 115, 116, 117 and 114	60 & 10
	Nos. 67, 66, 65 and 64	60 & 10
	Nos. T1135L to Y1135A *Change List* of K1135A and Y1135A, 2 in. to $2.40, 2¼ in. to $2.50.	60 & 10
	Nos. 1134A and M1134A	60, 10, 10
	Nos. 1135, Y1135 and 1134P	60, 10, 10
588	Shutter Bars Nos. 11 and 1	66⅔
	" " Nos. 71, 72 and 73	70
591	Window Springs, Nos. 19, 17	60 & 10
615	Axle Pulleys	55
616	" " No. 6	50
	" " Nos. 0, 00	40
616A,B	Pulleys on these pages have Turned *Polished* Wheel instead of *Copper Plated*, and the Brass Face Pulleys Nos. 24 and 26 will not be packed with screws.	
617	Axle Pulleys: No. 10 No. 12, Add 2¼ in. list $1.80 No. 20, " 2¼ in. " $2.25 No. 24 is void. See page 616A. No. 120, Add 2¼ in. and change list as follows: Inch, 2 2¼ 2½ 3 $2.00 2.25 2.70 4.50	55
620	Ceiling Pulleys	55
620	Hot House Pulleys	60
620	Upright Pulleys	60
621	Side Pulleys	60
623	Screw Pulleys	60
624	Incased Screw Pulleys	60 & 10
625	" Swivel Pulleys	60 & 10
625	Clothes L. Pulleys, No. 63 (3 in., $2.25)	50
	Clothes L. Pulleys, No. 163 (3 in., $3.25)	60
626	Clothes Line Pulleys	55
627	No. 64 Clothes Line Pulleys (no change)	60 & 10
	All others on this page	55
628–630	Tackle or Awning Pulleys	60
636–639	Foot Scrapers (List of No. 7 is $2.75)	50
640	Shelf Brackets, No. 44	60
643	Shelf Brackets, Japanned, Tuscan and Berlin	60 & 10
646	Hand Rail Screws	70
652	Wrought Staples	80 & 10
653	" Hooks and Staples	80 & 10
654, 655	" Hasps and Staples	80 & 10
655	" Staples on Plates	80 & 10
655	" Wagon-Bow Staples	80 & 10
658	" S. Hooks, etc., whole page	80 & 10
659	Corner Irons	70 & 10
660	Awning Hooks	80 & 10
660	Sign Hooks	80 & 10
661	Pipe Hooks	80 & 10
661	Leader Hooks	80 & 10
662–665	Meat Hooks	80 & 10
666	" "	80 & 10
670	Trap Door Rings	80 & 10
670	" " " and Staples	80 & 10
673	Hitching Post Caps	75 & 10
678, 679	Covered Spring Snaps (*change list* of No. 161 to $14)	66⅔
689	Ox Balls (*change list* of No. 30 to $30)	55
689	Prize Ox Balls (Bronze Metal)	55
691	Kentucky Cow Bells	70
691	Western Cow Bells	70
692–694	Twine Boxes	55
707	Cork Pressers	45
708	Garden Hooks	66⅔
711	Shoe Hammers	55
721	Hale Meat Cutters	66⅔
724	Stebbins' Genuine Gates, Nos. 41 to 55	70 & 10
731	File Handles	55
731	Chisel "	55
733	Brad Awl Handles	55
733	Handled Brad Awls	55
748, 749	Squares, *change in lists:* Nos. 15 21 22 $276.00 10.00 12.00 Nos. 24 115 $16.00 300.00	
756	Box Chisels (All Box Chisels)	60 & 10
757	No. 40 Carpenter's Pincers	60
757	No. 42 "	50
766	Nos. 5, 6, Blacksmith's Drills	55
788–790	Store Truck Casters	50
791	Store Truck Casters, *Change list:* No. 813, $0.80. No. 808, $1.45.	50
792	No. 874, Store Truck Casters	50
914–917	Tacks, etc., *Revised list* of Oct. 19, '89	
	Cut Tacks:	
	American Iron	67½
	Quarter Weight in Assorted Boxes	67½
	Add for box, 10 cts. per 100 papers	Net.
	Swedes Iron	66⅔
	Swedes Upholsterers' Tacks	70
	Large Head Carpet Tacks:	
	Plain American and Swedes	70
	Tinned " " "	70
	Steel Carpet Tacks:	
	Blued and Bright	70
	Tinned	70
	Leathered Carpet Tacks	40
	Gimp and Lace, Swedes	66⅔
	" " " " Tinned	66⅔
	Looking-Glass Tacks	50
	Large Head Miners' Tacks	70
	Copper Tacks	50
	Tacks by the pound	66⅔
	Cigar Box Nails	50
	Chair Nails	62½
	Common and Patent Brads	60
	Finishing Nails (except Copper)	65
	Trunk Nails " "	66⅔
	Clout Nails " "	66⅔
	Copper Finishing, Trunk and Clout Nails at Market rates.	
	Shoe Nails	Net.
	Hob Nails	Net.
	Round Head Hungarian Nails	62½
	Zinc Glazier's Points	50
918	Japanned Lining Nails	30 & 5
918	Silvered " "	40 & 5
918	Japanned Saddle Nails	30
918	Silvered " "	40 & 5
918	Iron Escutcheon Pins	50
927	Stove Bolts	62½
928	Common Carriage Bolts	70, 10, 10
929	Bay State Tire Bolts	67½
929	Norway Phila. Tire Bolts	75
930	Copper Rivets and Burs	55
931	Tinned Belt Rivets and Burs	45
931	Black and Tinned Rivets, in papers	45
931	Black and Tinned Rivets, in bulk	45
931	Coopers' Rivets	45
931	Iron Rivets in bulk	45
932	Wire Clothes Lines: Nos. 18 19 20 $7.00 6.00 5.00	45
938	No. 77 Coes' Pattern Wrenches.	75 & 10
953	S. & Co., Grub Hoes, Mattocks. Picks	60
979	Kenewa Planes	60
979	U. S. Extra Planes	55
979	U. S. Polished Planes	55
979	U. S. Ship Planes	55
979	Miscellaneous U. S. Planes	50
980–982	U. S Molding Planes	60
983	U. S. Grooving Plows	50
996	Excelsior Augers, same list as No. 20: 2 inches and smaller 2¼ inches and larger	70 & 10 / 60
	Excelsior Auger Bits, same list as No. 50	70 & 10
1008	Ball Braces	60
1008	Barber's Braces, Nos. 10 to 15 Nos. 21 to 23 Nos. 71 to 73	50 / 55 / 50
1008	Drill Braces	25 & 10
1019	Champion Vises (*Change list* of No. 129 to $30)	50
1057	Streeter's "Sensible" Sad Irons	25
1066	Hotchkiss' Mouse Traps	45
1066¾	Easy-Setting Choker Traps	65
1070	Petroleum Faucets: Haydenville Mfg. Company's. Landers, Frary & Clark's.	60 / 60
1089	Giant Nail Pullers (*Change list* No. 1, $18; No. 2, to $15.	10

Trade.

The following advices in regard to the trade of Louisville, Ky., have been received under date 10th inst.:

The Hardware business continues remarkably good, notwithstanding bad weather and the usual season of dullness. Many jobbers, like manufacturers, are selling goods about 30 to 60 days ahead of ordinary demands; this they report is caused by present stiff prices and promises of further appreciation in values which the retailers and country merchants expect. These conditions cause an extra good trade, and the question naturally arises, What will be the results after these ordinary channels are filled? Some say that a dull season will follow, which will go hard with the dealers and reflect severely on the manufacturers. This state of things, should it come, can be readily borne by them if they choose to withstand it, as they are making money and should hold them up, but hindsight shows what will inevitably happen should they be tested. The upward tendency of the Steel market would indicate a rousing future business, but the trade is so accustomed to breaks about January 1 or soon after that they are slow to take hold and thereby give the support that the position calls for. Take Cut Nails, for instance; Slabs and Bessemer Steel are both advancing, Rods also are moving upward, yet the trade is slow to take hold of Nails at $2.25 here unless they are given one-sided contracts. One reason of the slow demand (which seems to effect several mills) is the large contracts for low-priced Nails still unfilled, and the discrepancy is so great between the cost of them and present price that jobbers do not want to have to pay the difference.

On the other hand, most mills are refusing to quote for delivery much into next year, not knowing what the Steel situation will develop. Price from store remains the same as last reported. Wire Nails are selling well from store and mill. More of these goods have been used this season than ever before. There is a good trade in Bar-Iron from store and the

mills are making no effort to sell, being comfortably fixed. Barbed Wire is again going out freely, consumers seeing they have to pay present prices are going ahead making improvements. Very little is being takenfrom mills, as they are uncertain what prices will rule for Rods. Common Carriage-Bolts advanced, much to the surprise of dealers, many of whom were caught unprovided. The general tone of the market is one of firmness, and now that there is a remarkably good business going on, all concerned are disposed to make the most of it and let the future regulate itself.

Shipping-Blank.

We give below a representation of the heading and ruling of the shipping-blank used by the Chapin-Wells Hardware Company, Duluth, Minn. In addition to its use in connection with the shipping of goods this blank is also used by them in taking inventory. The blanks are furnished to their stock men and turned in by them to the office, where the prices are extended and carried out. The sheets are then bound together, making a book, and to facilitate this are furnished with perforations on the edge. This method does away with any re-copying of the goods and is referred to as a most satisfactory way of taking inventory. The sheets are 9½ inches wide by 11¾ inches long, the ruling being the same on both sides, but the heading shown in the accompanying diagram is only on one side. The heading of the blank is shown slightly reduced in size.

OUT BY | DATE SOLD. | SALESMAN'S ORDER No. ..... YOUR ORDER ..... | FOLIO.

PACKED BY | TERMS. | No. ..... Chapin-Wells Hardware Co. | SALESMAN ..... | DATE BILLED.

CHECKED BY | SOLD TO ..... | JOURNAL.

TOWN ..... CO. ..... STATE .....

TIME SHIP ..... SHIP BY .....

REMARKS .....

SHIPPING CLERK.	QUANTITY.		LIST PRICE.	NET PRICE.	SALESMAN MUST NOT USE THESE COLUMNS.

Form of Shipping Blank.

Trade Topics.

From one of our subscribers on the Pacific Coast we have received the following inquiry, which we take pleasure in referring to those who are interested and can give the desired information:

We are at a loss to know where to get a first-class Orange-Clipper. It may seem strange that it should be a hard thing for us in this "orange land" to find a desirable tool. The wholesale as well as the retail trade are completely at sea in the matter.

From an Ohio house we have the following communication relating to the frequent changes of prices and the animated and unprofitable competition between manufacturers and also jobbers:

We wish to ask the question (and we doubt if any one can answer it) When will manufacturers learn to be wise? If there was not so much strife and more independence among manufacturers we would not have so much trouble in invoicing; but as it has been for several years prices are liable to change every 30 days or oftener. Sometimes quotations are made, but if you don't telegraph they are liable to change before you can place your order. We do not have such trouble with foreign goods. Of course the duty regulates this to a certain extent, but still it does not do it all. It seems to be the rule with American manufacturers to either have a feast or famine. If manufacturers (and we might hook jobbers to the same train) were willing for their neighbor to sell a few goods occasionally there would not be so much trouble, but some people have cultivated selfishness so long that they have a row of bristles right up their spinal column; and when they get them up too high they find their competitor also has a row just as long and stiff as their own. If we mistake not this is the source of so many changes in prices. There should be a more friendly feeling among manufacturers and jobbers. There is room for all and no reason why all should not have the balance on the right side of the ledger at the end of the year.

A well-known Hardware house in Ohio makes the inquiry whether any Hardware dealer has tried the cash system, and if so, how it is managed in selling contractors, shops, &c.

Items.

Lufkin Rule Company, Cleveland, Ohio, are making a specialty of furnishing their Folding Steel Pocket-Rules to manufacturers and persons for advertising purposes, the names of the purchasers of the Rules being prominently etched on them, with suitable reference to their line of business. In this way effective advertising is secured, the rules being desirable articles and furnished in a neat leather case for the pocket. The company advise us that so many orders of this character have come to them that they are giving the matter considerable attention, and at this season of the year, when concerns are generally making their plans for the extension of their business, this with other advertising methods is received with favor.

Orr & Lockett, 184 and 186 Clark street, Chicago, were favored with the contract for Builders' Hardware for the Auditorium, which was dedicated last week with imposing ceremonies. The contract was not thrown open for competition, but was given to the firm named solely because of their long experience in finishing large structures in Chicago and other cities of the West. Much of the Hardware was made after special designs prepared by Mr. Lockett. Part was manufactured for the firm by the Yale & Towne Mfg. Company, and part by workmen in Chicago under the direct supervision of the firm. The main floor of the Auditorium proper is finished in solid bronze and oxidized silver. The part devoted to offices is finished in Bower-Barffed Hardware, and the remainder of the building from top to bottom in solid bronze. The total cost of finishing the entire building will be from $35,000 to $40,000. Orr & Lockett have also just completed a private residence for a prominent Chicago merchant, in which all the Hardware was made after exclusive designs, the patterns having been destroyed after the work was finished.

The trade will observe the advertisement on page 57 in which the Southington Cutlery Company, Southington, Conn., call attention to their American-made Pocket-Knives and Razors, alluding not only to the quality of the goods, but to the neat packages in which they are put up.

Surpless, Dunn & Alder, 97 Chambers street, New York, have been appointed agents for the Empire Portable Forge Company, Cohoes, N. Y., manufacturers of Forges, Blowers, Axle-Pulleys, &c., and also for the Nashville Spoke and Handle Company, Nashville, Tenn., manufacturers of Axe, Pick and Sledge Handles, Spokes, &c. Of both of these lines of goods they will carry a stock in this city.

G. A. Buffington, for the past eight years traveling salesman for Hamilton & Matthews, Rochester, N. Y., will after January 1 be associated with Howe & Co., the well-known Hardware firm, of Troy, N. Y. Mr. Buffington has made many friends among the Hardware trade which he visits who will regret not seeing him as heretofore. One of his customers has written us, referring appreciatively to the pleasant business intercourse they have had with this gentleman, and in his new departure he will have the best wishes of many friends.

Sidney Shepard & Co., Buffalo, N. Y., have issued an illustrated catalogue of Grocers', Druggists' and Spice-Dealers' Goods. It represents an interesting line of Tea, Coffee and Spice Caddies, Cans for coffee, cake, crackers, etc., plain, oblong and round Cans, Dredge Spice Cans, Salve or Ointment Boxes and several specialties.

The trade will observe the announcement on page 34 in which a salesman who may be addressed "Direct," care of this office, makes known his desire to add to his present line of representation of Hardware manufacturers to the Hardware hauses in the leading Western cities. He is at present representing in this city some prominent manufacturing concerns, but is desirous of forming connections with others. His experience and wide acquaintance with the trade are referred to.

Pope Mfg. Company, Boston, Mass., are issuing the Columbia Desk Calendar for 1890. It is in substantially the same form as for last year with some improvements. It is a pad of 366 leaves, 5¼ x 2¾ inches, one for

each day in the year. A portion of each page is blank, leaving space for memoranda, the middle of the page being occupied by an extract from references made in newspapers by bicyclists or others to the lines in which the manufactures of the company belong. In this way interesting matter in regard to cycling and type-writing is brought to the attention of those who use the calendar. By an ingenious arrangement accommodations are furnished in the support of the calendar for pen or pencil.

John Sawbridge has sold his business at Tower, Minn., and has gone into the Hardware and Stove trade at Port Townsend, Washington. He suggests that catalogues, circulars, &c., may be addressed to him at the latter place.

Horton, Gilmore, McWilliams & Co., Chicago, one of the most enterprising establishments in the Hardware and Cutlery business, have inaugurated a new departure. Having purchased a large number of the New York Standard Watch Company's watches, they intend to present one with each order received for $25 worth of Pocket-Knives. These watches are stem-winding and stem-setting, and are inclosed in cases of a new and fine metal called Spanish silver, exclusively used by this company. The metal resembles silver newly polished, but unlike silver it will not tarnish, resisting the effects of sulphur, rubber, phosphorus and sulphuric acid, and having a very hard surface, not easily marred. In the manufacture of these watches we are advised that the best material, carefully selected and thoroughly tested, is used, the skill of the workmanship also being especially referred to. The convenience of jewelers and repairers will be served by making as far as possible the springs, hands, screws, jewels, &c., uniform in size and interchangeable with similar parts of other first-class American watches. A full line of material for the repair of these watches will be carried, and it is intimated that all orders from customers will be filled free. All movements, we learn, are full plate, straight line lever-worm escapement, jeweled, 18 size, quick train, stem-wind and set, with second hand. Where there is a good watch-case of an 18 size stem-wind with a poor movement, we understand that the movement could be taken out of this case and put into the gold or silver case. The following description of the watch may be of interest:

The design is of such beauty, its construction so novel and its finish so excellent, it is with confidence we venture the assertion that when placed beside other watches, each costing five times as much, a majority would choose the Standard. Its early admirers have christened it with many fanciful names. "The screw escapement watch," "the watch with a worm in it" and similar designations are titles frequently used to describe its identity. These characterizations are suggested by a grooved shaft, a screw-threaded arbor or a worm which forms part of the escapement and is one of the unique and salient features displayed in the movement.

The screw-threaded arbor acts directly with and propels the escape-wheel, and in the introduction of that principle, which is endless in its operation, they adopt the most uniform and accurate motor known to science. In this evenness and unvariableness of motion which the screw produces the simplest conceivable manner of registering time accurately has been solved. It is the strongest and most durable winding mechanism ever introduced into a watch. It is smooth and easy in operation, and in its construction all the difficulties of getting out of order, stripping gears and jumping hands which have perplexed other manufacturers have been overcome.

Horton, Gilmore, McWilliams & Co. carry a very extensive stock of Cutlery. In the Jackknife line alone they can show over 1000 patterns, and in their Penknife line from 400 to 500. It is the intention of this enterprising house to keep abreast of the times in every way. They will have something new in Bicycles this season, to which reference will be made in due time in these columns.

It will be observed that on page 54 there is the advertisement of a young man who is desirous of investing money in a profititable Hardware business, or to travel for a Hardware house. His experience in this line is alluded to.

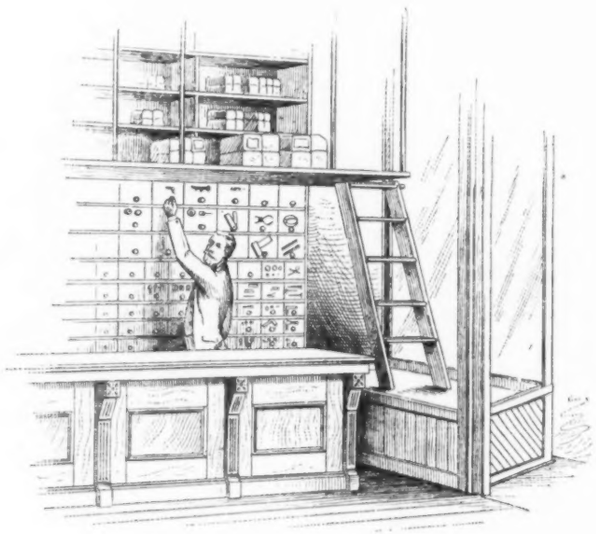


Fig. 404.—Arrangement of Hanging Shelf.

We are advised that Anton Trunk, 33 Chambers street, New York, has been appointed agent for the following houses:

F. C. Schimmelbusch, Solingen, Germany, Pocket Cutlery.
Isaac Hollis & Sons, Birmingham, England, Guns.
Joseph Bertrand, Liege, Belgium, Guns,

and that he has also been appointed agent for Southern territory for W. & S. Butcher, Sheffield. We are advised that he will sell only to importers.

The well-known Saddlery-Hardware house of C. B. Day & Co., Philadelphia, went out of existence 17th inst., thus removing from the business community probably the oldest business house of its kind in Philadelphia. It was established in 1845 by William P. Wilstach.

At a meeting of the trustees of the New American File Company, Pawtucket, R. I., J. E. Jenckes was elected treasurer. Mr. Jenckes is also treasurer of the E. Jenckes Mfg. Company, of the same city.

Arrangement of Stores.

A favorite method of arranging shelving is with a hanging platform, one on both sides of the store, a feature which in different modifications we have already illustrated. This platform is referred to by one of our correspondents as coming out in the store of which he writes to the inside edge of the counter, the under side being as far from the floor as a person can draw out a sample drawer. Such platform is represented in the accompanying illustration, Fig. 404. This illustration also shows one means of getting on to the platform by ladder from the front end. In this case through the front window the ladder could be seen painted white, with the firm's name upon it, an arrangement which is referred to as having some advantages. The ladder is usually in the center or back part of the store. In some cases the desk is upon the platform by the front window. With reference to the use of such platform, a correspondent writes:

There is generally shelving above the platform, where duplicate stock is kept, but no drawers. On the opposite side, which is usually used for Tin-Ware, the same arrangement is carried out. These platforms are hung by iron rods from the ceiling and have wires running from rod to rod with Tin-Ware hung on hooks. On the under edge of platform Bird-Cages are hung, giving them an excellent display, and they are so placed that they are in reach without using a pole to get them down.

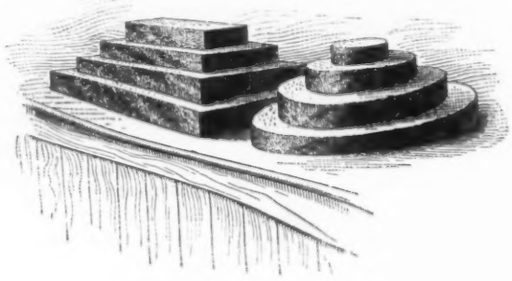


Fig. 405.—For Displaying Cutlery.

We are indebted to G. W. Robertson, Montgomery City, Mo., for a description of his method of accommodating roll-paper, as illustrated in the accompanying cut, Fig. 405. Mr. Robertson refers to the advantage of using this kind of paper and expresses the opinion that a great many more merchants would use it if there were no extra cost attached to its use in buying fixtures. The advantages of using this paper are referred to as being that it enables one always to have two sizes of regular paper at hand, besides innumerable small sizes which can be torn off as required, while the paper costs no more per pound than the cut paper. Mr. Robertson

has in use some patent cutters and some of his own construction, which are referred to as made in 15 minutes at a cost of 15 cents' worth of material, which are found to be better than any of the patented ones. One of these is illustrated in the cut. The directions for making such a paper holder and cutter are as follows:

Take a common curtain-roller and cut it 3 inches longer than the width of the roll of paper. Then take two 1-inch pine pieces, 2 x 6 inches, and bore a hole at the top of each for roller to slip through. Then take a common 3-inch Strap-Hinge and hinge it to a flat board or the counter, and slip your roller through the paper and through the holes in the ends of these uprights. The paper is thus suspended. Take another curtain-roller which also cut 3 inches longer than the paper, and take the fixtures attached to it and slip it under the roll of paper far enough to support the roll from lying on the counter or board underneath. Fasten the roller in this position and draw the paper to be torn off underneath this roller, as shown in the cut. Cut a sheet of Russia-Iron 3 inches wide. Concave it a little on stove-pipe rollers, fold one edge and fasten to edge of board or counter. This also is

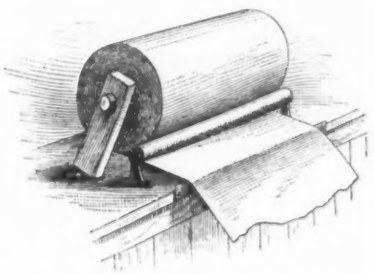


Fig. 406.—Paper Holder and Cutter.

indicated in the illustration. The roll always leans against this curtain-roller, keeping it from coming loose or running off too rapidly. Any desired length can readily be torn off with one hand while the other is holding the article to be wrapped.

A correspondent mentions an arrangement for displaying Cutlery, which is represented in the accompanying illustration, Fig. 406. The terraces or pyramids are made in the form shown, either round or rectangular, the risers being covered with tufted material, generally yellow, and the steps with some dark material. When plush or satin or other fine goods are used the effectiveness of the display is much increased. This arrangement is especially adapted for Pocket Cutlery, Razors or Scissors.

The Western Tinner.

BY KNARF.

The position and work of the Eastern tinner and his brother west of the Mississippi are so different as to cause remark from one who is used to Eastern ways. We will say a few words about the Western man which may be of interest to the Eastern readers. While the work may be more menial in some respects, the intimacy with the proprietor and his business is more elevating and fits him for his future life. We are speaking about shops in small towns which only employ one tinner and which really form the majority of Hardware stores in the West. A store of this kind combines Hardware, Stoves, Tin-Ware, Agricultural Implements and Pumps. In some cases the two latter departments are not included, but Hardware is rarely divorced from Stoves and Tin-Ware. The majority of Hardware merchants have been either tinners or farmers, the tinners always proving the most successful in business. The tinner is expected to open and sweep out the store in the morning, unless there is a clerk to do this work. He and the proprietor black the stoves and put them on the floor. It sometimes falls to his lot to "buck" or saw the wood for the heating-stoves in the shop and store. But when the "boss" is away he is supreme. He receives money and gives receipts for the same. He buys goods if the proprietor's absence is protracted, and is often called upon to give advice as to style or size or quality of goods when the proprietor is doing the buying. He sometimes keep the books, or if not keeps the run of the ledger, so he knows who owes and who is worthy of credit. In fact, there is nothing about the business he is not familiar with.

The work in the shop consists mostly of gutter and spouting, with an occasional porch or bay window to tin. When store buildings are erected there is usually a flat-seam roof to go on. The tinner cannot be a novice at his business, however, for he has a multitude of odd jobs, and some of them are very odd indeed. He has got to know how to drive a well, repair a pump and often is called upon to do a job of plumbing, putting in a bath-tub or making connection for a water-back. He often makes all the Tin-Ware required, working this up soon after the first of the year. He learns to be an expert in selling Agricultural Implements and starting Reapers. Change of location does not seem to be frequent, as a man will often work in the same place after he has learned his trade until he goes into business for himself, either in the same town or goes further West, where less capital is required. The traveling man would not think of passing the tinner by without shaking hands with him and inquiring about his work. He is too often a prominent factor in getting an order, and invariably buys what stock is required in the shop. As a result of the varied training he is prepared to carry on a business for himself when he saves enough money to buy a small stock. He is acquainted with the traveling men, who are only too glad to secure him for a customer when he embarks for himself. He knows all the town and country people so as to keep worthless accounts off his books. He could not buy such experience, but has been getting it free while drawing his salary and saving up his capital. In his own business life he profits by his employer's failures as well as his successes. He dignifies his work, never questioning his obligation to do it. Such a store generally has the shop in the back part of the store, with a warehouse back. Such a business runs from $12,000 to $20,000 a year. In a town I recall Smith was the pioneer tinner and Hardware man. Brown worked for Smith and then went in business for himself as the town grew larger. Jones worked for Brown after he started for himself, and subsequently engaged in business as the town still grew. So now Smith, Brown and Jones are all doing business in same place. This probably is not an isolated case. We have given an outline sketch of what our Eastern friends may be called upon to expect when they come West to work and "grow the country up." It is a happy life and insures success to the successful.

Exports.

PER BARK ROYAL, DECEMBER 2, 1889, FOR ADELAIDE, AUSTRALIA.

By Fairbanks & Co.—4697 pounds Scales.
By L. D. Crossmond & Co.—8 cases Agricultural Implements and 1 keg Parts.
By McLean Bros. & Rigg.—½ dozen Wringers, 4 dozen Hay-Forks, 33 pairs Spring Butts.
By Arkell & Douglas.—2 cases Mangles, 3 cases Hardware, 61,053 pounds Wire, 3 cases Hardware.
By Strong & Trowbridge.—1700 boxes Clothes-Pins.
By R. W. Cameron & Co.—50 dozen Wash-Boards, 180 dozen Handles, 36 dozen Handles.
By Mailler & Quereau.—4 cases Tin-Ware, 1 case Hardware.
By H. W. Peabody & Co.—20 cases Wringers, 3 dozen Wash-Boards, 19 packages Hardware, 1 case Blocks, 1 case Oil-Stoves, 1 case Perambulators, 1 case Wringers, 38 packages Hardware, 6 cases Lamp-Ware, 180 dozen Handles, 11 packages Stoves, 5 dozen Handles, 10 cases Hardware, 9 cases Perambulators, 1 case Wringers, 1 case Castings, 15 packages Stoves, 6 dozen Handles.

PER BARK WESTERN BELLE, DECEMBER 3, 1889, FOR DUNEDIN, NEW ZEALAND.

By Strong & Trowbridge.—1 case Hammers, 3 cases Handles, 1 box Nails, 1 case Felloe-Plates, 1 crate Ranges, 10 cases Axes, 1 case Drill-Machines and Grinders, 1 case Indicators, 1 case Drills, 2 cases Rivets, 1 case Hardware, 1 case Hooks, 1 case Mangles, 1 case Braces, 1 case Drawing-Knives, 1 case Glue, 1 case Sad-Irons and Choppers, 19 packages Stoves, 1 box Drills, 1 box Tinners' Shears, 1 box Pumps, 1 cask Pumps, 1 case Saws, 24 bundles Wash-Boards, 1 case Rakes, 1 case Augers, 2 cases Wringers, 1 case Hay-Knives, 8 crates Churns, 2 cases Forks, 1 case Sash-Cord, 1 case Hammers, 1 case Mangles, 1 case Handles, 4 cases Meat-Choppers, 2 packages Pumps, 1 case Trucks, 1 case Saws, 2 cases Hardware, 1 case Wringers, 4 crates Churns, 2 cases Axe-Handles, 1 case Trucks, 1 case Rakes, 3 Stoves, 1 case Hardware, 1 case Plated-Ware, 1 case Trowels, 1 case Hardware, 4 crates Plows, 1 case Saws, 1 cask Pumps, 1 case Egg-Beaters, 4 crates Churns, 1 case Meat-Choppers, 4 cases Axes, 1 box Granite Tea-Pots.
By H. W. Peabody & Co.—3 packages Tools, 5 cases Handles, 1 case Hardware, 24 packages Lamp-Ware, 74 packages Hardware, 28 packages Stoves, 5 cases Carriage-Ware, 2 dozen Step-Ladders, 4 cases Agricultural Implements, 3 cases Sash-Cord, 3 cases Axles, 7 cases Wringers, 30 dozen Handles, 5 crates Churns, 250 pounds Rubber Packing, 2 packages Pumps, 392 pounds Nails, 1 barrel Blocks, 1 barrel Blocks, 17 packages Hardware, 7 packages Lamp-Ware, 2 cases Carriage-Ware, 2 cases Axles, 4 crates Stoves, 22,400 pounds Barb-Wire, 1 case Bolts, 1 case Oilers, 1 case Agricultural Implements, 3 cases Grind-Stones and Fixtures, 3 packages Lamp-Ware, 20 dozen Handles, 4 packages Hardware, 1 case Agricultural Implements, 2 cases Scales, 1 hogshead Lamp-Ware.
By Arkell & Douglas.—3 cases Whip-Stocks, 3 boxes Pumps, 18 cases Axle-Grease, 3 cases Whips, 9 cases Hardware, 1 box Pumps, 1 bale Cordage, 5 cases Hardware, 1 box Tacks, 6 cases Edge-Tools, 12 packages Wash-Boards, 4 barrels Lamp-Ware, 6 boxes Scales, 4 cases Lanterns, 4 cases Wringers, 13 cases Handles, 17 packages Hardware.

FOR LYTTLETON.

By Mangam & Ackermann.—3170 pounds Nails.
By H. W. Peabody & Co.—22 cases Carriage-Ware, 3 cases Hardware, 72 dozen Handles, 4 crates Churns, 15 packages Lamp-Ware, 1 case Blocks, 1 case Stamped-Ware, 1 case Agate-Ware, 1 dozen Wringers, 1 case Lamp-Ware, 17 packages Lamp-Ware, 44,800 pounds Barb-Wire, 1 case Stamped-Ware, 10 packages Wash-Boards, 1 case Brushes, 28 packages Hardware, 1 bale Sash-Cord, 1 case Agricultural Implements, 198 dozen Handles, 1 case Fish-Lines, 1200 pounds Nails, 2 casks Pumps, 8 cases Carriage-Ware, 1 case Castings, 2 cases Hardware, 20 dozen Handles, 2 cases Wringers, 1 case Agate-Ware, 2 casks Pumps.
By Arkell & Douglas.—6 cases Nails, 20 cases Axes, 10 cases Fruit-Jars, 5 cases Handles, 1 cask Pumps, 4 cases Saws, 3 cases Granite-Ware, 10 racks Churns, 15 packages Hardware, 6 boxes Hardware, 4 crates Churns, 1 cask Pumps, 2 cases Hardware.

FOR DUNEDIN AND LYTTLETON.

By R. W. Cameron & Co.—3 cases Axles, 1 bale Sash-Cord, 3 boxes Wringers, 3 packages Sad-Irons, 2 cases Hardware, 6 bundles Spades, 225 pounds Oil-Stones, 4 cases Hardware, 2 dozen Churns, 1 box Tin-Ware, 3 boxes Cages, 9 dozen Axes, 2 cases Wringers, 1½ dozen Wringers, 12 dozen Mouse-Traps, 4 packages Hardware, 3 cases Saws, 240 dozen Axe-Handles, 100 dozen Pick-Handles, 2240 pounds Axle-Grease, 28 packages Lamp goods.

PER BARK DECIMA, DECEMBER 6, 1889, FOR BRISBANE, QUEENSLAND.

By A. Field & Co.—41 dozen Harness-Ware, 25 sets Axles, 17 dozen Harness-Ware, 27 dozen Whips, 14 dozen Harness-Ware, 8 dozen Hardware, 8 dozen Hardware, 15 dozen Hammers, 40 dozen Tools.
By Coombs, Crosby & Eddy.—100 feet Hose, 12 Wheel-Barrows, 100 pounds Stove-Fittings.
By Welsh & Lea.—12 cases Iron-Bolts.
By Meriden Brittania Company.—2 boxes Plated-Ware.

By Edward Miller & Co.—11 packages Lamp Goods.
By Reed & Barton.—111 pounds Plated-Ware.
By Fairbanks & Co.—2920 pounds Scales.
By H. W. Peabody & Co.—560 pounds Nails.
By R. W. Cameron & Co.—3 boxes Hardware, 2 boxes Hardware.
By Collins & Co.—10 dozen Axes.
By Winchester Repeating Arms Company.—8000 Cartridges, 1 case Guns, 30 Guns, 1 case Tools and Primers, 10,000 Metallic Cartridges, 100,000 Primers, 7000 Empty Shells, 2000 Loaded Shells, 100,000 Primers, 10,000 Empty Shells.
By Strong & Trowbridge.—6 dozen Shovel-Handles, 1 case Cow-Bells, 1 case Tools, 12 dozen Axe-Handls, 2 dozen Hay-Forks, 2 dozen Spading-Forks, 1 case Hammers, 3 bundles Wash-Boards, 5 dozen Spades, 2 dozen Hay-Rakes, 2 cases Carriage-Springs, 2 cases Axles, 2 cases Wagon-Springs, 2 cases Castings, 1 package Nails.
By V. Basanta.—1¼ dozen Velocipedes, 4 gross Whip-Handles, 12 gross Handles, 3 gross Meat-Choppers, 3 gross Axle-Grease, 6 dozen Handles, 24 dozen Hammers, 1 dozen Corn-Mills, 1 dozen Corn-Shellers, 1 case Hammers, 28 dozen Lamp Goods, 2 dozen Alarm-Tills, 1 dozen Hand-Bells, 18 dozen Locks.
By Arkell & Douglas.—3 packages Wringers, 4 boxes Pumps, 2 cases Hammers, 30 crates Stoves, 3 cases Jacks, 1 case Hardware, 5 barrels Wire, 4 cases Lamp-Ware, 7 packages Hardware, 15 cases Handles, 10 cases Axle-Grease, 1 case Wicks, 80 cases Edge-Tools, 3 cases Hardware, 2 cases Bolts, 54 packages Carriage-Ware, 3 cases Hardware, 44 cases Handles, 9 cases Bellows, 2 cases Axles, 12 cases Axle-Grease, 2 cases Wringers, 4 cases Hammers, 15 boxes Staples, 14 cases Choppers, 2 boxes Freezers, 12 cases Lanterns, 4 racks Churns, 7 cases Saws, 10 cases Shellers, 3 cases Oil-Stone, 12 cases Scales, 24 bundles Wash-Boards, 2 casks Pumps, 126 cases Edge-Tools, 55 packages Hardware, 25 cases Axle-Grease, 20 cases Handles, 2 cases Hardware, 7 packages Lawn-Mowers.

PER SCHOONER GALENA, DECEMBER 9, 1889, FOR EAST LONDON, SOUTH AFRICA.

By Arkell & Douglas.—350 pieces Agricultural Implements, 97 packages Carriage-Ware, 54 cases Plows, 106 cases Plows and Parts, 40 dozen Axes, 20 dozen Hatchets, 1056 pounds Sash-Weights, 48 Plows, 3500 pounds Nails, 25 dozen Axes, 24 dozen Handles, 1989 pounds Bolts, 27 dozen Hardware, 3 cases Springs, 1 case Axles, 60 dozen Hardware, 18½ dozen Hardware, 5000 pounds Wire, 438 cases Plows and Parts, 6500 pounds Nails, 96 dozen Hatchets, 12 dozen Axes, 10,580 pounds Sash-Weights, 22 Ranges, 29 cases Plows and Parts, 6 dozen Locks, &c., 4 dozen Hatchets, 3 Washers, 6 Corn-Shellers, 3 Store-Trucks, 4 dozen Axes, 1 case Scoops, 12 dozen Hatchets.

PER BARK MEDBOR, DECEMBER 11, 1889, FOR PORT NATAL, SOUTH AFRICA.

By H. W. Peabody & Co.—2 cases Nails, 24 cases Edge Tools, 6 cases Hardware.
By Coombs, Crosby & Eddy.—13 dozen Axes.
By Corner Bros. & Co.—1 case Irons, 68 cases Tools, 230 cases Agricultural Implements.
By Marcial & Co.—1 gross Wrenches, 1 dozen Choppers, 1 dozen Irons, 8 Mills, 3 dozen Cages, 6 1-6 dozen Locks, 6 crates Washing-Machines, 12 dozen Wrenches, 1 case Axles, 1 case Springs, 4 dozen Ladders, 10 Shellers, 6 Lawn-Mowers, 1 crate Handles, 7 cases Plow-Beams, 1 case Washita-Stones, 1 case Bench-Screws, 1 case Hooks, 17 cases Handles, 4 dozen Rakes, 2 cases Pumps, 43 cases Plows, 1 case Plows and Bolts and Nuts, 5 Corn-Shellers, 4¼ dozen Handles, 10 cases Hatchets, 2 cases Planes, 13 dozen Brackets, 1 case Stone-Cutters, 1 case Drills, 1 package Irons.
By W. H. Crossman & Bro.—10 dozen Axes, 30 dozen Picks, 1½ dozen Corn-Shellers, 1 dozen Store-Trucks, 60 dozen Handles, 11,089 pounds Sisal Rope, 40 dozen Hatchets, 1 dozen Sausage-Stuffers, 10 dozen Tools, 1000 Spokes, 1 Road-Scraper, 10 dozen Wheel-Barrows, 542 dozen Tools, 3 cases Tools, 5 dozen Lamps, 16,673 pounds Jute Rope, 6 dozen Ladders.

The American Federation of Labor, lately in session in Boston, elected these officers: President, Samuel Gompers; vice-presidents, W. H. Martin, of the Amalgamated Association of Iron and Steel Workers, and P. J. Maguire, of the United Brotherhood of Carpenters and Joiners; secretary, Christopher Evans, of the Miners' and Mine Laborers' Union; treasurer, Henry Enrich, of the Furniture Workers' Union. Detroit was selected as the location of the next annual meeting.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

No branch of the trade has fared as well the past week as the Artists' Materials department. All firms making a specialty of that line state that sales have been very large and in some cases beyond the most liberal expectations. Manufacturers and jobbers alike state that the present holiday season has eclipsed all previous ones as to amount and variety of goods handled. Getting down to the staple articles in the line of Paints and Colors, however, the experience is not as flattering. To the contrary, the only inference that can be drawn from the reports made is that the volume of business all along the line has been moderate and hardly up to the most modest calculations. The delay on the part of the National Lead Trust in announcing prices for White Lead for next year's delivery has a restraining influence upon operations in many lines, and there is little probability of a change for the better until that question is settled one way or another. The trust has a variety of interests to look after, and there is no doubt that the satisfactory arrangement of matters for all concerned is a knotty problem. The devising of ways and means to earn a dividend on $60,000,000 of water capital, in addition to about $20,000,000 of legitimate capital, is a task of itself. The Corroders' Association, including as they do manufacturers not in the trust, have to be considered, and the perfecting of plans to preserve some uniformity of prices in the jobbing and retail branches is undoubtedly a difficult matter. It is no secret that grinders insist upon more liberal prices than they have been receiving, and there is more than a bare possibility that large establishments may branch out in the business of corroding Lead themselves if satisfactory terms are not made by the powers that be.

White Lead, &c.—As regards business the past week reports have been uniform. All note a moderate distribution of Lead in Oil and none have any reference to even conditional orders having been placed for that article or for Dry Lead for future delivery. The current transactions are at old prices. Red Lead and Litharge are in similar position and prices for the pigments remain without change.

Zincs.—A moderate jobbing movement is about all that has taken place in American Oxide and the market is without change in any particular. Foreign Zincs also continue rather slow, but are firmly held at the old line of prices.

Colors.—Nothing new comes to the surface regarding the Paris Green situation and the future is enigmatical in the full meaning of the word. The indications are that there will be an open market throughout the coming season, and that is paramount to a virtual scramble for orders. The closest secrecy as to prices is observed by sellers and buyers alike. Other Colors have not changed perceptibly and business throughout is of strictly conservative type.

Miscellaneous.—Whiting has had fair sale and prices for the several grades are steady. English Cliffstone and American Paris White are also moving fairly at steady prices. Clays slow at the present time, but quite firmly held.

Animal and Vegetable Oils.

There have been few features of special interest in this branch of trade. Business has proceeded in a perfunctory sort of way for the most part and the monotony has been relieved only to a slight degree by new developments or rumor. Taken as a whole, the distribution of the most prominent articles makes quite as good a showing as could reasonably be expected at this season of the year and the general position is considered favorable. Cotton-Seed-Oils are still the prominent exception to the rule, prices particularly for the crude article still showing a declining tendency under the instance of pressure of stock for sale by the trust for delivery this month. Lard-Oil is less firm at this time than a week ago, but the balance of the list has held fairly steady.

Linseed-Oil.—City crushers have made no changes in their prices. Raw Oil made from Calcutta seed stands at 62¢ and the American Seed product at 60¢. Outside brands come this way in moderate quantities only and are disposed of at about 58¢. Business has been rather slow the past week and chiefly of jobbing character. The market for seed continues strong, leaving no better chances than heretofore for cheaper Oil.

Cotton-Seed-Oils.—Crude Oil has been sold to the extent of several thousand barrels for delivery this month and next at prices ranging from 28¢ down to 27¢. The bulk of the business was at the lowest price, with the trust the chief sellers. Refined Oils have been moving in a moderate way only and are without important change, but rather weak.

Lard-Oil.—The transactions in this article have been rather light and the market presents a dull appearance, with some tendency of prices in buyers' favor, yet no positive decline quoted. For present make prime 54¢ is doubtless an extreme outside price.

Sperm and Whale Oils.—There has been no movement whatever of the crude products the past week, but supplies are held very firmly at previous prices. In the manufactured Oils there has been a fair trade at firm prices.

Menhaden-Oils.—Apart from the purchase of some Southern stock for export there has been no business of importance in crude Oil and the market is showing no material change. The refined products are selling fairly in jobbing quantities at stated prices

Cocoanut-Oil.—Several lots of Ceylon have been sold at 5¼¢, ex-vessel, and 5⅜¢ @ 5½¢ are about the top figures at present for stock in store. Cochin has been very quiet and no movement of domestic is noted.

Olive-Oil.—Italian in barrels has remained very steady at 73¢ for ordinary quality, but the demand is momentarily slow and wholly for rather small lots.

Tallow-Oil.—The price for city double-pressed Tallow-Oil is down to 48¢, and the market is dull at the decline.

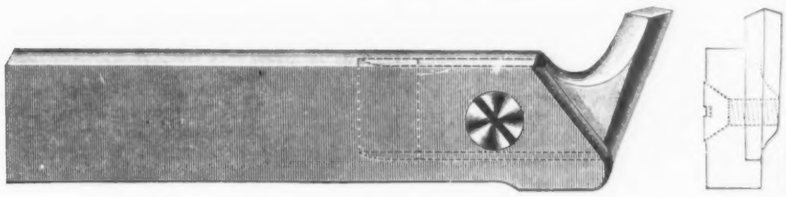
Red Oils.—Saponified is down to 4½¢ for Western and 4¾¢ @ 5¢ for city brands, with the movement very slow.

A dispatch from Baltimore, under date of the 9th inst., reads as follows: "Andrew Carnegie bought to-day from a syndicate consisting of Charles F. Meyer, president of the Baltimore and Ohio; ex-Senator Henry G. Davis, of West Virginia; William Keyser and Osmun Latrobe, 1500 acres of coke lands near Uniontown, in the Connellsville region; $500,000 was the price paid."

Bristol Brass and Clock Company, Bristol, Conn., said to be the only concern in the country producing their own sheet metal and combining every process in the manufacture of silver-plated flat-ware and German silver goods in their own works, have recently greatly increased their line by the addition of new patterns of flat-ware.

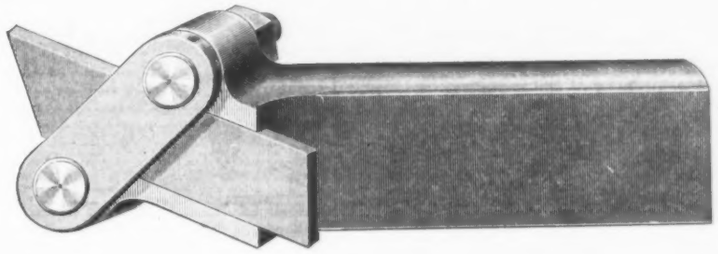
Cutting-Off Tools.

The tools of which we herewith present illustrations are made by the Dwight Slate Machine Company, Hartford, Conn. The diamond-point is shown full size, the cross-section being through the holding-screw. The shank of the holder is 1¼ x ½ inches. These tools are drop-forged from the best tool-steel, and are intended to be kept in stock in the tool-room. It is stated that the cost of a diamond-point is less than the tool-steel in rough.



Diamond-Point Holder.

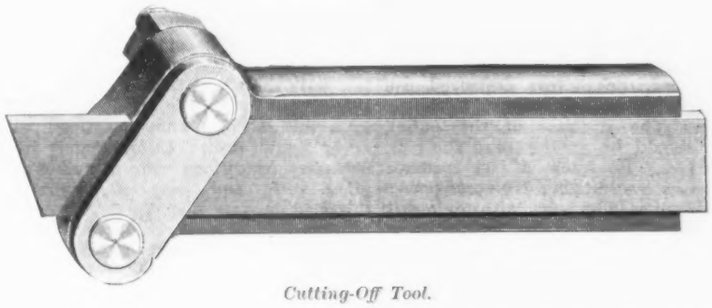
The cutting-off tool consists of a holder and a movable blade or cutter. The holder is drop-forged from steel and case-hardened. The under edge of holder is extended, giving blade firm support directly under cut. The shank of holder entering tool-post is 1¼ x ½ inches. The blades are 6 inches long, ⅞-inch wide, milled and ground on both sides to give proper clearance. The top or cutting-edge and bottom are ground square, to gauge of slot in holder. Hence the blades used in this style of holder require grinding on the end only. In the manufacture of these blades the steel is worked without annealing, and is hardened at a low heat. It is claimed that the process of hardening employed secures a blade superior to the regular forged blade, because after hardening the entire blade, the temper is drawn in the lower half, leaving the upper or cutting edge as hard as fire and water will make it. This gives the hard cutting-edge a cushion or support of soft, tough metal and renders the blade more durable and less easily broken than if left hard throughout. In use the blade can be set to project beyond the supporting-lip of the holder, on under side, only a sufficient distance to cut to center of stock, and on heavy stock the blade can be advanced after making a cut of about 1 inch on outside. The blade is held in position by a substantial strap, bolts and case-hardened nuts.



Offset Holder.

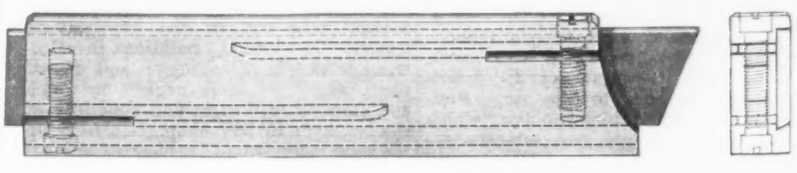
The various uses to which the off-set holder can be put are apparent. The short blades from the straight holder can be placed in this.

In the Crescent cut-off tool the holder is of steel, case-hardened and formed with a milled recess for receiving the blade. The tool will meet the requirements of users who desire to withdraw the holder from the tool part without changing the position of the same. The upper edge of the recess stands at right angles to the back, the lower edge making an angle of 80°. Traverse slots are cut from the top and bottom of each end entirely through the stock of the holder for a short distance, the cuts being continued so as to overlap each other at the center, where they do not extend through the metal, as indicated by the dotted lines. The small set-screws in the ends draw the parts temporarily together for grinding, and are not intended to aid in holding when the cutter is in use. The blade is held while in use by the pressure of the binding-screw of the tool-post, and a sufficient stock of metal is provided to prevent the holder becoming permanently bent or set at the point of contact. The blade requires grinding on the end only, as the upper edge is square and always ready for use.



Cutting-Off Tool.

Several fine specimens of steam-ship work may be seen at the yard of the Delaware River Iron Shipbuilding and Engine Company, at Chester, Pa. The steam-ship Kansas City, for the New York and Savannah route, is nearly completed. The Yumuri and Orizaha, for the New York and Cuba Steamship Company, now well advanced, will rank among the finest steamers in the coasting trade. The Plymouth, the new iron steam-boat for the Old Colony Steamboat Company, is nearly all plated, and she will be the next vessel launched from the yard. The gun-boats Concord and Bennington could be launched almost at any time. The New York and Brazilian mail steamships have many frames up.



Crescent Cut-Off Tool.

Rope, Belt and Gear Driving.

At the last meeting of the Manchester Association of Engineers the above subject was introduced by Mr. Rea, who said there was a good deal to say in favor of each of the three systems. Three main divisions might be made in gear-wheels, those which worked iron to iron, those gearing iron to wood and those in which wood to wood were used.

The objections usually taken to the use of wheels were as follows: 1, liability to break down; 2, noise in working; 3, cost of grease; 4, cost of foundations; 5, friction; 6, loss in transmitting power, and, 7, the difficulty in increasing speeds. He proposed to show that many of these objections had no foundation in fact. Years ago wheels were not made so accurately as now, and many break-downs occurred in consequence of the faulty shape of the teeth. He was in favor of a short tooth—not more in length than five-eighths or eleven-sixteenths of the pitch. It was also better in wheels beyond a moderate diameter to build up the wheel, putting on the rim in segments. The method of keying these segments to the end of the arms was an important matter. Iron, wood and India-rubber keys had been used. With reference to the last-named he had some samples which showed that the rubber soon became vulcanized and ceased to be a cushion. Wood keys he thought were the best, as they gave a cushion of the best and the most lasting kind. He knew of wheels 5-inch pitch and 16-inch face which had been driving an iron-works for 30 years and had only one broken segment during that time. Then there was the matter of speed, which was usually put at 2500 feet per minute on the pitch-line as a maximum. He had under his charge a pair of wheels which had been transmitting 700 horse-power since 1874 both night and day and were running at a speed of 4500 feet per minute. These were geared to a rolling-mill through which 700 billets were rolled per day, so that the shocks were great, yet the wheels were practically noiseless. He had made repeated dynamometer tests, and had not found a loss in transmission with spur-wheels of more than 2½ per cent., and about 3½ per cent. with bevels. On the whole, the transmission of power by gearing was the best system if the conditions were properly fulfilled. In iron-works, owing to the positive driving

required, wheels were essential. The fixings and foundation should be amply strong, and also the shaft, which should be designed as for main driving. Helical teeth were not suited for main driving.

With reference to belts, they supplied a ready means of providing an elastic transmission of power. The co-efficient of friction varied in different cases, but the loss of power ranged from 4 to 6 per cent. The speed at which belts should be run varied from 3000 feet per minute with single belts to 5000 feet with double ones. The journals for the shafts in belt-drives should be three to four times the diameter and the belts should be periodically lubricated with castor-oil. It was not generally known that by placing one belt above another the power could be doubled, and a third belt superimposed would give a further increase.

Speaking of rope driving Mr. Rea said that there was a great loss of power by this system, ranging from 10 to 25 per cent. There was another point worthy of attention, viz., that different ropes on the same pulley varied alike in tension and velocity. For instance, if a new rope was working alongside one which had sunk ½ inch, the velocities of the two would vary materially. Further, the varying diameters of the pulleys destroyed the proportion of effect obtained from the velocity. The distance of the pulley centers should be greater than those in belt drives. He knew of an instance where ropes transmitting 600 horse-power had been replaced by belts, with the result that 700 horse-power was now transmitted. Unless ropes were properly used and looked after their cores soon became soft, and in some cases were reduced to dust. The velocity found to be the best was from 4000 to 5000 feet per minute, and the cost of maintenance per 100 horse-power was variously stated as from £5 to £20 per annum. The ropes should not be of too large a diameter, 1¾ inches being preferable to 2 inches. On the whole, he ventured to say that gear-driving was the best.

Emery-Wheels.

The eleventh lecture in the regular course before the Franklin Institute, of Philadelphia, was delivered on December 9 by Mr. T. Dunkin Paret, president of the Tanite Company, Stroudsburg, Pa. Subject, "Emery-Wheels." The lecturer referred to the scarcity of literature on this subject, and then gave from such literature and his own knowledge a brief historical sketch of the industry. It was claimed by a British authority that the solid emery-wheel was invented in 1842 by an Englishman, but this same authority admits that the Americans lead in the industry. He claims for both British and American wheels superiority over those made on the Continent of Europe. Emery-wheels were broadly classed under three heads—those made by some process of vitrifaction, those which are practically artificial stones and those whose base is of vegetable or animal origin. In the first two classes were inherent defects, such as brittleness, hidden cracks and flaws, unequal tension, tending to glaze or clog up with metal, and in some the tendency to deteriorate on exposure to the air. Preference was given to the third class, which could be divided into two sub-classes—those which were mechanical mixtures and those which were chemical compounds or unique substances. As examples of the latter he named the vulcanized oils and gums, metamorphosed woody fiber and tanite. For all kinds of solid wheels the makers made strong claims, but as yet these claims had not been substantiated or refuted by careful scientific investigation. Such investigation was needed in order that the comparative value of the different makes could be demonstrated, and also their value as compared with other tools and machines. The industry was young, and it could not be expected to have the full development which characterized older ones. It was only now that the most experienced wheel-makers were ready to put their industry on a scientific basis, and now the users had lost all faith as to there being any science in the business, while they still felt that solid wheels were a necessity. There were many mistaken demands upon the solid wheel. It was intended to grind and not to polish and was not meant to supersede all other metal-working processes. The solid wheel had its place on elaborate machines as a substitute for the steel tool usually employed there. It could be used on special machines to do more perfect work than the steel tool and to work on harder substances. It could be used on general machines as a competitor of the file, grindstone and cold-chisel. The solid emery-wheel was the great metal remover. A mechanical professor had characterized the grinding-room as a cast-iron slaughter-house. To do full work wheels should be put on heavy machines and based on substantial foundations. The work must be in continous contact with the wheel. Being so, the wheel became a rotary file which ran a mile in a minute and whose cutting points never grew dull. Unfortunately these necessary conditions were often not complied with, and only a fraction of the possible work was done. The visible results of a working wheel were very misleading. The greatest delusion was to make durability the standard of perfection in a solid wheel. While it was possible to have a wheel wear out too rapidly for economy, yet very few American wheels were too soft, the bulk being too hard and their durability being more than balanced by the decrease in metal removal. These facts were illustrated by statistical tables.

A brief sketch was given of the abrading minerals generally used in solid wheels. General and special machines were described. A few typical uses were explained. The safety of wheels was discussed. Some new uses were alluded to and suggestions made as to the probable future development of the industry.

Various exhibits were made. Among these were the glass guides used in silk mills, which are now being repaired by solid wheels. Pieces of saw-plate and cast-iron were shown to illustrate some of the statistical tables. One of these demonstrated that in equal time the wheel had cut 126 times as much as the file. This was on saw steel. In certain other trials the wheel had removed 21 times as much cast-iron as the file and 34 times as much brass.

The power needed to drive solid wheels was said to be much less than is usually supposed. The lecturer claimed that this industry opened a wide and interesting field, as yet little explored, where both students and experts could do good work. He alluded to the greater fascinations held out by the problems in transit, in bridge building in electrical work, in metallurgy; and feared there might be some neglect to watch and improve the every-day practices of the factory, mill and shop. He held up the solid emery-wheel business as one example of the possibility of elaborating a great economy out of a small industry.

Chairman McKinley, of the Ways and Means Committee, has introduced a bill to reduce the salaries of custom-house appraisers. The chief appraiser at New York is paid $6000 under the new bill, instead of $8000, as now, and at this city and Boston the chief appraisers are to be $4000, instead of $5000, and in Baltimore, where the like is paid, the reduction is to $3000. The assistant appraisers are each paid $4000, and are to be cut to $3000, except at Baltimore, where the salary is to be $2500.

Our consul at Rotterdam has made a report to the State Department in regard to the recent successful strike of the dock-workers of that city, in which he says that it is the general impression there that there will be a demand for increased wages throughout commercial Europe during this winter and that the increase will be allowed.

CONTENTS.

Ship-Building on the Lakes....951
Automatic Gear-Cutting Engine. Illustrated....951
Bethlehem at the Maritime Exhibition....952
The New Providence Cable Tramway....952
Band-Saw Guide. Illustrated....954
Westinghouse Machine Company's Works. Illus....954
Screw Machine. Illustrated....958
The Latrobe Steel Works....958
The Buena Vista Company....959
The Freight-Car Famine....959
Calcined Lime as Furnace Flux....960
Ocean Lane Routes....962
The Week....962

Manufacturing:
- Iron and Steel....964
- Machinery....964
- Hardware....965
- Miscellaneous....965

The Speculation in English Pig-Iron Warrants....965

Editorials:
- The Western Outlook for Foundry Pig-Iron....966
- Labor Plots and Counterplots....966
- Basic-Steel Manufacture in the South....966
- Our Imports of Iron and Steel....967
- Late Developments in Japan....967
- Opportunities Wasted by Iron Manufacturers....967
- Mexican Lead-Ore Importations....967

Obituary....968
Providence Notes....968
Ferro-Silicon for Machinery Castings....968
A Chicago Ship-Yard....969
Washington News....969
Personal....969

Trade Report:
- Philadelphia....970
- Cincinnati....970
- St. Louis....971
- Louisville....971
- Cleveland....971
- Detroit....971
- Chicago....971
- Chattanooga....972
- Pittsburgh....972
- New York....973
- Financial....973
- Metal Market....974
- New York Metal Exchange....974
- Coal Market....974
- Imports....975
- British Iron and Metal Markets....975
- Markets by Telegraph....975
- Foreign Markets....976

The New Torpedo-Boat Cushing....976

Hardware:
- Wire Nails....977
- Cut Nails....977
- Barb-Wire....977
- Miscellaneous Prices....977
- Guarantee of Prices....977
- Tacks....977
- Sargent & Co....978
- Trade....978
- Shipping-Blank. Illustrated....979
- Trade Topics....979
- Items....979
- Arrangement of Stores. Illustrated....980
- The Western Tinner....981
- Exports....981

Review of the Wholesale Market in Paints and Oils:
- Paints and Colors....982
- Animal and Vegetable Oils....982

Cutting Off Tools. Illustrated....983
Rope, Belt and Gear Driving....983
Emery-Wheels....984
Current Hardware Prices....985
Current Metal Prices....990
Classified List of Advertisers....95
Alphabetical Index to Advertisers....98

CURRENT HARDWARE PRICES.

DECEMBER 18, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ₱ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
G. B. Genuine Imported.....45¢
Eley's E. B.....54¢ & 55¢
Eley's D Waterproof, Central Fire...$1.00

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands, 20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40@40&5%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8... 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8... 4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80 — 20&2%

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....20@20&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11½@11¾¢
Trenton.....9¼@9½¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....₱ doz $4.75
Antrim Combination.....₱ doz 5.50
Baldwin.....₱ doz 5.25
Champion.....₱ doz 7.25
Daisy.....₱ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gem.....₱ doz 5.25
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State.....₱ doz 30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6 00
Turntable.....₱ doz 4.50
Victor.....₱doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.50
72.....₱ doz 4.25
76.....₱ doz 5.75
78.....₱ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, Rockford Bit Company.
Cook's, Douglass Mfg. Co.
Cook's, N. H. Copper Co. — 70%
Ives' Circular Lip.....55 %
Patent Solid Head.....50%
C.E. Jenning & Co., No. 10, extension lip.....30%
.E. Jennings & Co., No. 30.....40%
.E. Jennings & Co., Auger Bits, ₱ set, 32⅔ quarters, No. 5, $5; No. 30, $3.50.....60%
Lewis' Patent Single Twist.....20%
Russell Jennings' Augers and Bits.....45%
Imitation Jennings' Bits.....25%
Snell's Jennings Pattern.....60%
Pugh's Black.....60%
Rockford, Jenning's Pattern.....20%
Car Bits.....60%
Snell's Car Bits.....50&10@60%
L Hommodieu Car Bits.....60%
Forstner Pat. Auge Bits.....15&10%
Cincinnati Bell-Hangers' Bits.....10%

Hollow Augers—

Ives'
French, Swift & Co.
Douglass'
Bonney's Adjustable, ₱ doz $48.....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....30@30&5%
Cincinnati Standard.....25&10% — 33⅓ @ 33⅓&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₱ gross $2.75@$3.25
Diamond.....₱ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal.....40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ₱ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ₱ doz,....40&10%
Pat. Sewing, Long.....₱ doz $1.20
Pat. Peg, Plain Top. ₱ gr $10.00...45&10%
Pat. Peg, Leather Top. ₱ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg. ₱ gr $2.45, 40@40&10%
Awls, Pat. Peg...₱ gr 65¢....40@40&10%
Awls, Shouldered Brad...2.70 ₱ gr.....35%
Awls, Handled Brad..$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch. ₱ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18.....25%
Henry's Combination Hafts...₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality.....₱ doz $6.00@$6.50
Others.....₱ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes.....₱ gr $9.50
Dixon's Everlasting, in bxs...₱ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting...10 ℔ pails, ea. 85¢
Lower grades, special brands, ₱ gr $5.50@$7.00

Axles—

No. 1, 4¼@5¢, No. 2 5½@6¼¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½% — 3% cash
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....₱ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24 ℔.....₱ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₱ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's. ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ₱ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₱ gr..60&10%
Van Sand's Old Pat., $15.00 ₱ gr..55&10%
Washburn's Old Pattern, ₱ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ₱ gr.....$9.00
Security Gravity, ₱ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger.....₱ ℔ 7½@8¢
Barbed, ⅜ in.....₱ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....70&12½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, according to size...75&10@80%
Bolt Ends, according to size..75&10@80%

Tire—

Common, list Feb. 28, '83.....67½%
Port Chester Bolt and Nut Company: Empire. list Feb 28, '83.....67½%
Keystone, Philadel., list Oct. '84...80%
Norway, Phila., list Oct. '84.....75%
American Screw Company: Norway, Phil., list Oct. 10, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....67½%
R.B.&W., Philadel., list Oct. 16, '84...80%

Stove and Plow—

Stove.....62½%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....₱ ℔ 9½@10¼¢

Boring Machines—

	Without Augers.	Upright.	Angular.
Douglass	$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	...40&10&10
Jennings	5.50	6.75	...45@45&10
Other Machines	2.35	2.75	net
Phillips' Patent with Augers	90	7.50	

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co..50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60@5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....85%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts. — ,70&5@ 70&10%
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Japanned, Plated Tips.

Wrought Steel—

Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad. — ,70&5@ Table Butts, Back Flaps, &c.... 70&10%
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....₱ ℔ 5½@6¢
Dewicks (Burke).....₱ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55&60%
No. 5, Iron Handle.....₱ gr $6.00, 45&50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75&3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ₱ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00.....35&5%
Domestic, ₱ doz $2.50.....40%
Champion ₱ doz $2.00.....50%

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed, Plate, Shallow Socket, Deep Socket } Brass....55@55&10%
} Others...60@60&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884 50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.00 5.70 4.80 4.20 3.90 3.75 3.65 3.55
Less than cask lots, add ½¢@1½¢ ₱ ℔.
German Coil, list of June 20, 1887 50&10&5&60%
German Halter Chain, list of June 20, 1887.....50&10&5&60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5@5&5¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W., New Haven, Witherby, Mix, Ohio Tool Co. } ..75 @ 75&10 %
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....4 %

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5&10&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises,
Carpenters', Cincinnati.....1.5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....60%&5&70%
Norway Spring Bar Clips, 5-16...60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4½¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.50.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby, P. S. & W., Mix, New Haven } ..75@ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50.20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools....$1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits

Drill Chucks.—See Chucks.

Dripping Pans—
Small sizes.....₱ ℔ 6¼¢
Large sizes.....₱ ℔ 5¾¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co.).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ kegs, ₱ ℔	4¾¢	5½¢	2¾¢
¼ kegs, ₱ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60@10&60@10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands....60@10@70%
Fair brands.....60@10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter, ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10&30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10 @ 75¢
Acme Fry Pans.....60&10%

Fuse—
₱ 1000 ft
Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10&20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Ties 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.... } List Jan. 15, '87
Humason & Beckley... } 50@50&10%
Atha Tool Co.....
Fayette R. Plumb.....40&10@50%
C. Hammond & Son...List, Oct., 1889, 50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢
3 to 5 ℔.....₱ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10¼¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25

Handles—
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	.50

.....60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%

Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50 } 50¢ dis
Hickory Firmer Chisel, large. ₱ gr 5.00 }
Apple Firmer Chisel, ass'd... ₱ gr 5.00 }
Apple Firmer Chisel, large... ₱ gr 6.00 }
Socket Firmer Chisel, ass'd.. ₱ gr 3.00 }
Socket Framing Chisel, ass'd. ₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 7 75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake Shovel, c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢
Hangers—
Barn Door, old patterns...60&10&10&70%
Barn Door, New England..60&10&10&70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track..... ... ... 55%
ed's Steel Arm..... ... ... 50%
allenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00 ..... 50&2%
Cheritree .....50&10%
Kidder's .....50&10&60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15&60%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15&60%
Carrier Steel Anti-Friction.....50&50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30&30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10&25&10%
Warner's Pat.....20&20&10%
Stearns' Anti-Friction.....20&20&10%
Stearns' Challenge.....25&10&25&10&10%
Faultless.....40&40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60&60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel. ..40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star .....40&10&40&10&5%
May .....50&5&50&10%
Barry, $6.00.....40&10%
Harness Snaps—
See Snaps.
Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35&40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10&50%
Hurd's.....40&10&50%
Fayette R. Plumb.....40&10&50%
Wm. Mann, Jr., & Co.....50&50&5%
Underhill Edge Tool Co....40&5&40&10%
Underhill's, Haines and Bright 33⅓%
C. Hammond & Son.....40&10&50%
Simmons'.....40&10&50%
Peck's.....40&10&40&10&5%
Kelly's.....50&50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10&40&10&5%
Collins.....10%
Schulte, Lohoff & Co.....5&50&5%
Hay and Straw Knives—
Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½&40&10%
Carter's Needle.....₱ doz $11.50&$12.00
Heath's.....₱ doz $13.50&14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay .....₱ doz $10.00
Hinges—
Wrought Iron Hinges
Strap and T.....70&10&75%
Screw Hook and Strap. 6 to 12 in., ₱ lb. 4 2-10¢; 14 to 20 in., ₱ lb. 3 7-10¢; 22 to 36 in., ₱ lb. 3 2-1 ¢
Heavy Welded Hook. 6 to 12 in., ₱ lb. 4 2-10¢; 14 to 20 in., ₱ lb. 3 7-10¢; 22 to 36 in., ₱ lb. 3 2-10¢
Screw Hook and Eye. ⅜ in., ₱ doz $1.50; ½ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80; 10%
Rolled Blind Hinges, Nos. 32 and 34 .....50&10%
Rolled Blind Hinges, Nos. 232 and 234 .....55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges 8, 10 & 12 in., ₱ lb.....5¢
"Providence" over 12 in., ₱ lb. ....4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch 55%
American, Gem, and Star.. .....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15&20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic .....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour .....70&2%
Nicholson.....45&10%
Butler 50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5&80%
Clark's Mortise Gravity..... ...50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
O. S., Lull & Porter.....75&10&80%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50. ....25&2%
Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern..30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. 60&5@ 60&10%
Hubbard & Co.,S. & O. Pat.60&5&60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5&60&10%
Grub..... ... .60&60&10%
Hog Rings and Ringers—
Hill's Improved Ringers. . ..₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs. .....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 9¢@$1.00
Champion Ringers..... ₱ doz $2.00
Champion Rings, Double. ₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30
Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's.....25%
Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders..... 20%
Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.. .....55&5&60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889..... .....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton..... .....
Meriden Britannia Co..... 40&5%
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co ..... 40&5&5%
William Rogers Mfg. Co.....
Hooks—
Cast Iron—
Bird Cage, Sargent's list.....
Bird Cage, Reading..... ... 60&10&10%
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat,Reading .50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y.Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt. .....80&80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55&60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.
Horse Nails—

	Nos. 6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.. .....10½ @ 11¢, net
Essex .....28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 25@25&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢.20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28 28¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ 0¢ 19¢ 18¢. 10&10@12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢..40&10%
Empire Bronzed. .....14 ₱ lb.
Horse Shoes—See Shoes Horse.
Hose, Rubber—
Competition..... ...75&10@75&10&5%
Standard..... .....70@70&10%
Extra..... ....@@60&10%
N. Y. B. & P. Co., Para..... .....30&10%
N. Y. B. & P. Co., Extra..... 50%
N. Y. B. & P. Co., Dundee.....60&10&5%
Huskers—
Blair's Adjustable..... ....₱ gr $8.00
Blair's Adjustable Clipper... ..₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50
Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest $3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3 00
See also *Pails.*
Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ lb....	24¢	21 ¢
Brass larger than 17 in., ₱ lb.	26¢	23½¢

Enameled and Tea Kettles. See *Hollow-Ware.*
Keys—
Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c .....33⅓&2%
Hotchkiss' Brass Blanks..... .....40%
Hotchkiss, Copper and Tinned..... .....40%
Hotchkiss' Pad. and Cab..... .....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%
Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%
Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives 25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives.₱ doz $1.50, 15@20%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%
Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%
Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives 25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives.₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50
Knobs—
Door Mineral..... .....65@68%
Door Por. Jap'd..... .....75@78%
Door Por. Nickel..... .....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Ladles,—
Melting, Sargent's.....55&10%
Melting, Reading .....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W .....35&10&40%
Melting, Warner's.....30%
Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%
Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%
Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved .....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King .....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 1₱ 19 20
$4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%
Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co. ,list Mar.20, 1889..... 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88..... Much
Sargent & Co.,list Aug. 1, '88 lower net
Reading Hardware Co., list Feb. 2, '88..... prices often made.
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40@40&10%
Yale .....net prices
Deltz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Felter or American. ....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Par- List March, '84, rev
ker and Corbin... Jan.1,'85..33⅓&2%
Deltz, Nos. 36 to 39..... .....40%
Deltz, Nos. 51 to 63.....40&10%
Deltz, Nos. 86 to 96..... .....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.... ....40%
Barnes Mfg. Co..... .....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin. ..33⅓%
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84. ....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 9l.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deltz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40@40&10%
Barnes Mfg. Co..... .....40@40&10%
Neck's 30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140... . .90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150..... ...50%
Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish. $16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00
Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross..... .....$17.00
Mallets—
Hickory ....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%
Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.50
Mattocks. Regular list..... .....60&5%
Meat Cutters—
Dixon's ₱ doz..... ... 40&5%

Nos.	1	2	3	4
	$14.00	$17.00		$30.00

Woodruff's ₱ doz ..... 40&5%

Nos...	100	150
	$15.00	$18.00

Champion ₱ doz ....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz..... ...70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American..... .....30%

Nos.....	1	2	3	4	5	6
Each.....	$5	$7	$10	$25	$50	$60

Enterprise..... .....30%

Nos....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania..... ...40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz ....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1..... ₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..5	2	6	8
	$50	$75	$80	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter.₱ doz $66.00
Mincing Knives—
Am. (2d quality, ₱ gr., 1 blade blades, $12; 3 blades, $18.....net
Lothrop's..... .....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles .....50&10@60%
Buffalo Adjustable..... ₱ doz $3.00, 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Molasses Gates—
Stebbin's Pattern..... 75@75&10%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10
Weed's.....20&10%
Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10.....60&10&10%

Money Drawers...₱ doz, $18@$20

Muzzles—
Safety.....₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889....70&5%
Tack Mfrs.' list.....60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base....$3.00 @ $3.10

Nail Puller—
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Nail Sets—
Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—

uts ,off list Jan. 1, 1888:	Square.	Hex.
Hot Pressed	5.1¢	5.8¢
Cold Punched	5.1¢	5.4¢

In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government.....₱ ℔ 7½@7¾¢
U. S. Navy.....₱ ℔ 6½@6¾¢
Navy.....₱ ℔ 5¼@5¾¢

Oilers—
Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz.
.....10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60@60&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2

Packing, Steam—
Rubber—
Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander.
₱ ℔ 65¢, 30%
Jenkins' Standard.....₱ ℔ 80¢, 35%
Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13¢@14¢ ₱ ℔
Cotton Packing.....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—See Trade Report

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.94	3.15	3.57
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25 %
Star Pails, 12 qt.....₱ doz $6.00
Fire, Stable and Milk, 14 qt..₱ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14 qt	6.50	7.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60 @ 60&5%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....50%
1¼ and under, Galvanized.....42½%
1½ and over, Plain.....62½%
1½ and over, Galvanized.....50%
Boiler Tubes, Iron.
1¾ and under.....50%
2 in. and larger.....55%

Planes and Plane Irons—
Wood Planes—
Molding.....50&10&2%
Bench, First Quality.....55&10&2%
Bench, Second Quality.....60&10&2%
Bailey's (Stanley R. & L. Co.).....40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes.....35&35&5%
Meriden Mal. Iron Co.'s.30&10&30&10&10%
vis's Iron Planes...30&10&30&10&10%
Birmingham Plane Co.....50@50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes.....40@40&5%
Sargent's.....30&10@30&10&10%
Plane Irons—
Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....35%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—
Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz.....20&10@33⅓&5%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in., $21.00, 40@40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.
Prestoline.....20&10%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—
Bishop's I. X. L.....₱ doz $0.50
Bishop's O. K.....₱ doz $5.50
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $3.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00, 25&10%
Fletcher Post Hole Augers, ₱ doz $30, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18.00
Ryan's Post Hole Diggers...₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15.....45%

Potato Parers—
White Mountain.....₱ doz $5.00@5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55&60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....60&60&10%
Pitcher Spout, Best Makers.....67½&70%
Pitcher Spout, Cheaper Goods..70&70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co.'s Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'.....₱ doz $1.44, 55%
Tinners' Hollow Punches.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25..net

Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods.....70%
Cast Steel, outside goods.....60&10@70%
Malleable.....70&70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AA 1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%

Razor Strops—
Genuine Emerson.....60@60&5%
Imitation " ....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%

Rivets and Burrs—
Iron, list Nov. 17, '87.....45%
Copper.....50@50&10%

Rivet Sets.....50&10%

Rods—
Stair, Brass.....25&2%
Stair, Black Walnut.....₱ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—
Manufacturers' prices:
Manila...½ in. and larger ₱ ℔ 14½¢
Manila...⅜ in. ₱ ℔ 14¾¢
Manila.....¼ and 5-16 in. ₱ ℔ 15 ¢
Manila Tarred Rope.....₱ ℔ 13⅜¢
Manila, Hay Rope.....℔ ℔ 14¾¢
Sisal...½ inch and larger ₱ ℔ 11 ¢
Sisal.....⅜ in. ₱ ℔ 11¼¢
Sisal.....¼ and 5-16 in. ₱ ℔ 11¾¢
Sisal, Hay Rope.....₱ ℔ 11 ¢
Sisal, Tarred Rope.....₱ ℔ 10¾¢
Sisal, Medium Lathe Yarn, ₱ ℔ 10 ¢
Cotton Rope.....₱ ℔ 15&18¢ net
Jute Rope.....₱ ℔ 7½¢
1½% for cash in 10 days.

Rules—
Boxwood.....80&10&10@80&10&10&5%
Ivory.....50&50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—
From 4 to 10, at factory ...₱ 100 ℔, $2.60@$2.75
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'.....₱ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40%
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....5¢, 15%
Mahcuy's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30 %

Sand and Emery Paper and Cloth—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—
Common.....₱ ℔, 10@11¢
Patent, good quality.....₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 28@29¢
Common Russia Sash.....₱ ℔ 13½¢
Patent " " .....₱ ℔ 15¢
Cable Laid Italian Sash.....₱ ℔ 22¢@23¢
India Cable Laid " .....₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....25½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab, 39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢..30&30&5%
Braided, Drab Cotton, 55¢....30&30&5%
Braided, Italian Hemp, 55¢..30&30&5%
Braided, Linen, 80¢.....30&30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr. .33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....60%&10&60%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60&60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Fayson's Perfect.....60&60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&60&10%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888, 55&55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Sash Weights—
Solid Eyes.....₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50&50&5%
Perry ....₱ doz, No. 1, $15.00; No. 0, $21.00.....50&5&50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10&30%
Silver's.....40&10%

Saws—
Disston's Circular.....45@45&5% } Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back.....₱ foot 27¢@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Diamond Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—
White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished.....₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, $9, No. 15, $5.50; 20& 10@20&10&10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion.....₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—
Atkins' Perfection.....₱ doz $15.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50¢
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00, 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons...33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
Knapp & Cowles' No. 1.....60&20@70%
No. 1 Extra.....60@60&10%
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@35&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw Driver Bits.....₱ doz 50@75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets.No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw-Drivers.....25&10%

Screws—
Wood Screws—List March 1, 1889

Flat Head Iron.....50%	Extra 5 @ 10 % often given
Round Head Iron.....40%	
Flat Head Brass.....45%	
Round Head Brass...35%	
Flat Head Bronze....45%	
Round Head Bronze.35%	

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%

Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners'.....20@2%
Seymour's, List, Dec., 1881.....60&10@60@60&10@10&5%
Heinisch's, List, Dec., 1881.....60&10@10@60&10@10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers.....80&10@80@10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory, $4.00
Mule—
Add $1 ₩ keg to above prices.
Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—
(*Eastern prices 2¢ off, cash, 5 days.*
Drop, ₩ bag, 25 ℔.....$1.21
Drop, ₩ bag, 5 ℔.....30
Buck and Chilled, ₩ 25-℔ bag.....1.46
Buck and Chilled, ₩ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@2&7½%
Hussey, Binns & Co.....15&25%
Hubbard & Co.....20@2&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889...45&10%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barier's Pat.) Flour Sifters....₩ doz $2.00; ₩ gr $21.60
Electric.....₩ gr $18.00
Hunter's.....₩ doz $2.00
Smith's Adjustable Sifters....₩ doz $2.00
Smith's Adjustable Milk Strainer.₩ doz $2.00
Smith's Adjustable T. & C. Strainer.₩ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ doz..	75¢	95¢
Mesh 20, Nested, ₩ doz..	90¢	$1.05
Mesh 24, Nested, ₩ doz..	$1.10	1.20

Slates—
School, by case.....50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargen. ₱Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list...70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } 1 mos
Boardman's Britannia Spoons, case lots.....60 } net
Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron..... } 75&10@80%,
Nickel-Plated..... } full cs. ex. 10%
Try Square and T Bevels...60&10@60&10 &10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10¼ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized. } Same price
Fence Staples, Plain..... } as B'rb Wire See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25&30%
Reece's New Screw Plates...33⅓&5@40%
Reversible Ratchet.....30 %
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₩ ℔ 2½¢
Washita Stone, Extra.....₩ ℔ 19@20¢
Washita Stone, No. 1.....₩ ℔ 14@15¢
Washita Stone, No. 2.....₩ ℔ 10@11¢
Washita Slips, No. 1, Extra..₩ ℔ 36@38¢
Washita Slips, No. 1.....₩ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₩ ℔ 40¢
Turkey Slips.....₩ ℔ $1.00@1.50
Lake Superior, Chase.....₩ ℔ 16¢
Lake Superior Slips, Chase...₩ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₩ ℔ 18@20¢
Seneca Stone, High Rounds..₩ ℔ 20@25¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—
Joseph Dixon's.....₩ gro $6.00,¶10%
Gem.....₩ gro $4.50, 10%
Gold Medal.....₩ gro $6.00, 25%
Mirror.....₩ pro $6.00, —%
Lustro.....₩ gro $4.75
Ruby.....₩ gro $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ $5.00
Boynton's Noon Day, ₩ gro.....13.00
Parlor Pride Stove Enamel..₩ gro $ cans
Yates' Liquid, 2 3 5 10 gal...8¢ ₩ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 15¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish.₩ gro $9.00
Bonnell's Paste Stove Polish..₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00

Tacks, Brads, &c.—
List Oct. 19, 1889, extra 10&2 % cash.
Carpet Tacks—
American Iron, Blued.....70%
American Iron, Tinned or Cop'd...70%
Steel, Plain or Bright.....70%
Steel Tinned or Coppered.....70%
Swedes Iron, Blued.....70%
Swedes Iron, Tinned or Co₀'d.....70%
American Iron Cut Tacks.....67½%
Swedes Iron Upholst'rs' Tacks, S. S...70%
Swedes Iron Upholst'rs' Tacks, Tinned, S. S.....70%
Swedes Iron Card and Upholsterers' Tacks, Lanc.....66⅔%
Swedes Iron Card and Upholsterers' Tacks, Tinned, Lanc.....66⅔%
Gimp and Lace Tacks Lanc., Swedes Iron.....66⅔%
Gimp and Lace Tacks, Lanc., Swedes Iron, Tinned.....66⅔%
Gimp and Lace Tacks, S. S 70%
Gimp and Lace Tacks Tinned, S. S..70%
Swedes Iron Basket or Trimmers' Tacks, Lanc.....66⅔%
Miners' Tacks, S. S.....70%
Bill-Posters' or Railroad Tacks, Lanc., Swedes.....66⅔%
Bill-Poster's' or Railroad Tacks, S.S..70%
Copper Tacks.....50%
Copper Finish. & Trunk Nails.....50%
Cigar Box Nails.....50%
Zinc Glaziers' Points.....50%
Picture-Frame Points.....50%
Looking-Glass Tacks.....50%
Brush Tacks.....50%
Tin-Capped Trunk Nails.....60%
Finishing Nails.....65%
Trunk & Clout Nails. Black & Tin'd.66⅔%
Common and Patent Brads.....60%
Hungarian Nails.....62½%
Basket and Chair Nails.....62½%
Leathered Carpet Tacks.....40%
Miscellaneous—
Double-Pointed.....82½%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&5%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Planished, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co's.₩ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₩ doz, $24, 55&10%
Acme.....₩ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reliher's, list Jan. 1, 1887.
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood,Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50, 15%
Mouse, Bonanza.....₩ gr $10.00
Mouse Delusion.....₩ gr $15.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz ,90¢; in full cases, ₩ doz....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ½ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ½ ℔ Balls.....	16¢	27¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.48@50¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ Balls.....12¢@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box.....50&10@60%
Parallel—
Fisher & Norris Double Screw....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓&35%
Sargent's.....66⅔&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2¾¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩ doz Fol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	½	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	2	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized—
See Trade Report.

Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₩ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—See Trade Report.
Market,
Br. & Ann., Nos. 0 to 18.....67½%
Cop'd, Nos. 0 to 18.....62½%
Galv., Nos. 0 to 18.....57½%
Tin'd, Tinned list Nos. 0 to 18.....57½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....70%
Bright and Ann'd, Nos. 19 to 26..70&5%
Br. and Ann'd, Nos. 27 to 36.....75%
Tinned.....70%
Tinned Broom Wire.....70@70&5%
Galvanized Fence.....60%
Annealed Fence, Nos. 8 and 9.....67½%
Annealed Grape, Nos. 10 to 14.....67½%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin'sSteel and Tin'd Wire on Spools, 50%
Malin's Brass and Cop. Wire on Spools40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30
Steel Music Wire, Nos. 12 to 30..55¢ ₩ ℔
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₩ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....70@70&10%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....25@30%
Iron, Galvanized.....30%
Cast Steel.....35%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co. 70&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
Goes' Pattern, Wrought..... } 75&10@75
Girard Agricultural..... } &10&5%
Lamson & Sessions' Agric'l.. }
Sterling Wrought..... }
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches....15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 2, 1886, 80&20@80&25%

CURRENT METAL PRICES.

DECEMBER 18, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.	₩ lb 2 00 @ ....¢
Refined Iron:	
⅜ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in. 4½ to 6 in. x ⅜ to 1 in	₩ lb 2.20 @ ....¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.40 @ ....¢
Rods—⅜ and 11-16 round and sq.	₩ lb 2.30 @ ....¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.50 @ ....¢
"Burden Best" Iron, base price	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price	₩ lb 2 80 @ ....¢
"Ulster"	₩ lb 3.00 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¼¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 3.00	@ 3.00¢	3.50	@ ....¢
17 to 20	₩ lb 3.25	@ 3 25¢	3.50	@ 3.75 ¢
21 to 24	₩ lb 3.35	@ 3.35¢	3.75	@ ....¢
25 and 26	₩ lb 3.45	@	3.75	@ ....¢
27	₩ lb 3.55	@ 3.62½¢	4.00	@ ....¢
28	₩ lb 3.75	@ ....¢	4.25	@ ....¢
	B. B.			2d qual.
Galv'd, 14 to 20,	₩ lb, 5.00	@	4.75½	@ ....¢
Galv'd, 21 to 24,	₩ lb, 5.37½	@	5.12½	@ ....¢
Galv'd, 25 to 26,	₩ lb, 5.75	@	5.50	@ ....¢
Galv'd, 27	₩ lb, 6.12½	@	5.85½	@ ....¢
Galv'd, 28	₩ lb, 6.50	@	6.23	@ ....¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B	₩ lb 5¢ @ 7¢			
Craig Polished Sheet Steel	₩ lb, 8¼¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	23¾¢
English, Pigs	23½¢
Straits in Bars	23¾¢

Tin Plates.

			Per box.
	Charcoal Plates.—Bright.		
Melyn Grade	IC, 10 x 14	@	$6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.50
" "	IC, 20 x 28	@	13.00
" "	IX, 10 x 14	@	8.00
" "	IX, 12 x 12	@	8.25
" "	IX, 14 x 20	@	8.00
" "	IX, 20 x 28	@	15.75
" "	DC, 12½ x 17	@	6.00
" "	DX, 12½ x 17	@	7.50
Calland Grade	IC, 10 x 14	@	6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.40
" "	IX, 10 x 14	@	7.65
" "	IX, 12 x 12	@	7.90
" "	IX 14 x 20	@	7.65
Allaway Grade	IC, 10 x 14	@	5.60
" "	IC, 12 x 12	@	5.75
" "	IC, 14 x 20	@	5.60
" "	IC, 20 x 28	@	11.00
" "	IX, 10 x 14	@	6.75
" "	IX, 12 x 12	@	6.90
" "	IX, 14 x 20	@	6.75
" "	IX, 20 x 28	@	13.50
" "	DC, 12½ x 17	@	5.30
" "	DX, 12½ x 17	@	6.30
	Coke Plates —Bright.		
Steel Coke.—IC, 10 x 14, 14 x 20		@	$5.12½
	10 x 20	@	7.25
	20 x 28	@	10.25
	IX, 10 x 14, 14 x 20	@	6 00
BV Grade.—IC, 10 x 14, 14 x 20		@	4.87½
	Charcoal Plates.—Terne.		
Dean Grade.—IC, 14 x 20		@	$5.10
	20 x 28	@	10.25
	IX, 14 x 20	@	5.90
	20 x 28	@	11.80
Abecarne Grade.—IC, 14 x 20		@	4.87½
	20 x 28	@	9.87½
	IX, 14 x 20	@	5.80
	20 x 28	@	11.60
	Tin Boiler Plates.		
IXX, 14 x 26	112 sheets		$13 00 @ $13.00
IXX, 14 x 28	112 sheets	@	13 25
IXX, 14 x 31	112 sheets	@	14.75

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem

Ingot.

Lake	@ 15¢
Baltimore Grade	@ 14¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	31	....	....	....	....
84	96		23	24	29	34	....	....	....	....
84		96	24	25	30	35	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.25	0.27	0 29	0.32

Bolt Copper, ⅜ inch diameter and over, per pound ....22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	37	33	30	29	28	27	24
15	13	38	33	31	30	29	28	25
16	14	39	34	32	31	30	29	26
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb

Bronze Tubing, 3¢ ₩ lb more than Brass.

Discount from list....25 @ ... %

Roll and Sheet Brass.

Discount from list....25 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢

Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¼¢
"Bergenport"	9¢
"Bertha"	9¢

Zinc.

Duty: Sheet, 2½¢ ₩ lb.

600 lb casks	6¼¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4½¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Solder.

½ @ ½ (Guaranteed)	14¾¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 32 ¢
Hallett's	" 23 ¢

Fittings.

Cast Iron Fittings, Black and Galvanized	75 %
Cast Iron Fittings, Bushings & Plugs	75&10@75&10&5 %
Cast Iron Fittings, Flanges	75 %
Malleable Iron Bushings	75&10@75&10&5 %
Malleable Iron Unions	70 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&5@75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	65 %
Radiator Nipples	60 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	50 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	62
" " boiled		63 @	65
" Western, raw		57 @	58
Lard, City, Extra Winter		55 @	56
" " Prime, present make		.. @	54
" " Extra No. 1		45 @	48
" " No. 1		38 @	42
" Western, prime		53 @	54
Cotton-seed, Crude, prime		.. @	28
" " off grades		26 @	27
" Summer Yellow, prime		35 @	36
" " " off grades		.. @	34
Sperm, Crude		.. @	65
" Natural Spring		.. @	..
" Bleached Spring		.. @	..
" Natural Winter		76 @	78
" Bleached Winter		81 @	83
Whale, Crude		.. @	40
" Natural Winter		46 @	..
" Bleached Winter		48 @	..
" Extra Bleached		51 @	..
Sea Elephant, Bleached Winter		58 @	60
Menhaden, Crude, Sound		22 @	24
" Crude, Southern		.. @	..
" Light Pressed		27 @	29
" Bleached Winter		32 @	33
" Extra Bleached		36 @	..